COTTON

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COTTON

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MR. MILL MAN! THIS IS FOR YOU.

C. R. Trowbridge says, "Organization is the spirit of progress and the spirit of progress is the greatest asset a business or an individual can have." He might also have most truthfully added that this same manifestation of the spirit of progress is the greatest asset of any specialized industry such, for example, as the cotton industry; it is also an asset to such groups of industries as have one or more interests common to all.

It is, however, a most difficult matter in this great country of ours to make manufacturers, widely separated in latitude or longitude, with varying climatic and industrial conditions, educated and matured in different environments, and often with different political views, see the absolute need of cooperation and organization as the prerequisite factor in the future industrial growth of the nation. It is a task of no small dimensions to secure practically unanmous cooperation and organization even within the borders of one state.

There are two obvious reasons for this lack of unanimity. The greater of these is the lack of definite individual knowledge as to just what can be accomplished by such cooperation and organization. The lesser objection is found in the petty jealousies which so often develop among the component parts of any one industry. The remedy for this latter difficulty lies within the individuals. The opportunity to offer a remedy for the first reason is the excuse for this sermonette.

In speaking of technical training, G. Gunby Jordan once said, "It is a pity that we have got to go to Germany for all our brains about things of this kind, but it's a fact, all the same, and especially for educated experience in this line." Suppose we look to Germany in this case for some "educated experience!"

German manufacturers are organized with such strength that at the beginning of the war they were important factors in the industry of almost every country on the globe. There were nearly 6,000 of these organizations, representing every industry in the empire, of which 5,000 were commercial organizations, 500 government-fostered syndicates for controlling prices and output and 300 organizations of employers.

The German textile industry, being dependent on foreign supplies for its cotton and wool, is not represented in the national producers' organizations, but has members in all the other syndicates. Wool dealers and wool manufacturers have interests in common and many of their organizations represent the interests of both.

The membership of the Bremen Cotton Exchange numbers nearly 700. It was founded in 1872 to promote the interests of the entire cotton trade of Germany by developing the cotton exchange market of Bremen. It is a member of the *Zentralverband Deutscher Industrieller*, of

Berlin, an organization of manufacturers, formed in 1876 to oppose the free-trade tendencies of the administration of that day, and to present a united front against the labor movement. The board of administration of the Bremen Cotton Exchange consists of 12 Bremen cotton dealers, 6 cotton spinners representing various manufacturers' associations, and a delegate from Austria and from Switzerland. There is also a small local association of cotton brokers at Hamburg.

The Woolen Trade Association was formed in 1900 when, in the course of a boom in this industry, some circles advocated the elimination of the middleman. This question was definitely settled shortly after the organization of the association, which now works hand in hand with the spinners' associations. In this trade, practically all disputes are settled by the arbitration courts of this association and the spinners' associations, as the interested parties realize that the questions involved are too technical for general courts.

The *Elsass-Lothringisches Industrielles Syndikat,* of Mulhausen, Alsace, which was founded in 1869, is now practically an association of textile manufacturers, being composed of 19 cotton-spinning establishments, 23 cotton-weaving mills, 30 cotton-spinning and weaving mills, 10 woolen-yarn spinners, 17 woolen mills, 8 combined woolen and cotton mills, 6 finishing establishments, 4 silk manufacturers, and firms handling auxiliary lines.

At Stuttgart there is an organization called the *Industrie- und Handelsborse,* which was established in 1860 to afford members an opportunity to exchange opinions on the state of business, to form new business connections, and to effect sales and purchases of yarn, cloth, and raw material. The exchange is under the direction of the Stuttgart Chamber of Commerce and any person or firm carrying on a business related to the textile industries may become a member.

The Association of Silesian Textile Manufacturers at Breslau has a membership of 125 firms and the Textile Manufacturers' Association of Chemnitz, a membership of 150 firms, employing 25,000 operatives.

An important employers' association in the textile trade is the Association of Employers in the Textile Industry, located at Chemnitz, with a membership of nearly 700 manufacturers, employing 125,000 workmen. All textile employers' associations in Germany are federated in the Employers' Federation of the German Textile Industry.

The Association of Saxon Spinners at Chemnitz has a membership of 55 manufacturers, representing 1,582,800 spindles. It is an evolution of an association founded in 1836 and represents one of the oldest trade associations in the empire. It aims to promote the interests of the cotton-spinning industry and allied trades.

The association maintains a bureau for confidential statistics of production, yarn stocks, orders on hand, and monthly shipments of yarn. This information, relating to members only, is confidentially exchanged for similar information furnished by the Association of Rhenish Westphalian Cotton Spinners. In cooperation with other organizations, the Association of Saxon Spinners has succeeded in establishing standard factory regulations for cotton spinning establishments. It has also helped to standardize trade conditions to the satisfaction of customers, as well as of spinners.

This association has been consulted by the government in the preparation of German customs tariffs, and commercial treaties, in the preparation of statistics for governmental use, and in many other ways, and is recognized as an important representative of the German textile industry. The organization has been active in securing lower fire insurance premiums and in the introduction of automatic sprinklers. As a member of the Bremen Cotton Exchange, it has promoted the interest of the spinners by determining sales conditions for cotton and by obtaining lower freight rates to interior spinning centers.

All the spinners' associations have discussed the introduction of the metric numbering of yarns, but have unanimously opposed adopting the custom until England also agreed to use it.

The Association of German Cotton Yarn Consumers is composed of manufacturers of knit goods and other wares in which cotton yarns are used. It maintains a monthly organ and issues periodical bulletins. The organization has paid special attention to customs tariffs, has endeavored to bring about uniform numbering of yarns, and interests itself in other matters affecting the export of German textiles. It has aided in forming German companies to raise cotton in West Africa, East Africa and Asia Minor.

German cotton manufacturers, in addition to forming organizations which foster their manufacturing interests, also hold membership in the national associations for increasing export trade. To judge of the merit of these commercial export organizations, we need but think of the success which has attended German efforts to enter markets in all parts of the world under all sorts of conditions and competition.

Commercial associations and price-fixing syndicates of Germany work hand in hand with the highly efficient system of commercial attaches, maintained by the empire at consulates throughout the world. This system was born at the Chicago world's fair as a result of the growth of German exports to the United States, due to the activities of a trained expert who was attached to the consulate general in Chicago during the fair.

German commercial houses long ago realized that export business did not result from sending catalogs to consulates, as it was almost impossible to interest foreign buyers in goods that were described in a language they could not read, with prices and measurements in systems with which they were unfamiliar. Now, their goods are sold in all parts of the world by salesmen who can describe the goods, discuss prices, credits and shipping arrangements in the language of buyers.

These salesmen do not represent particular houses, but are sent out by the national organizations. They carry trunks filled with samples and catalogs from the members of the association for which they are working. Neither the samples nor catalogs bear the names of the manufacturers, but are numbered, so that only the organization knows whose goods are being sold.

Usually an entire trunk is devoted to textile samples. The salesman first studies his new field and then takes his trunks to the buyer. In this way he gets better results than a commission agent who maintains a sample room and waits for buyers to come to him. The German salesman never leaves the territory until he has thoroughly covered it. Then, if possible, he establishes a sample room in charge of a local agent to take care of repeat orders.

The principal association of this kind has its headquarters at Berlin and is called *Centralverein Fur Handels-*

geographie und Forderung Deutscher Interessen im Auslande. It has a membership of 5,000 and publishes a weekly called "Export."

This organization was founded in 1878 to promote intercourse between Germans living abroad and those at home and to investigate prospects for the extension of the German foreign trade. One of its aims was to direct emigration to countries where conditions were favorable to the progress of German colonists. It maintains an office to furnish information to applicants and studies commercial conditions in all foreign countries. In 1886, it sent a floating exhibit to South America and opened a South American exposition in Berlin in the same year. It is largely responsible for the fact that when the war began, German commercial interests dominated South American markets.

The textile industry has many members in the permanent sample house at Stuttgart, called *Export-Musterlager.* This sample house is maintained by subscribers who pay annual fees of 25 marks ($5.95) which entitles them to one square meter of floor space. This sample warehouse distributes members' catalogs and the members may confer at any time with the managing director and his staff of experts regarding export problems. The sample house publishes its own catalog in which members are given free space. Samples are protected from examination by competitors, even though they be members of the association. A commission is charged on business transacted on the basis of samples exhibited. In 1911, this association took 4,600 orders for its members.

Cotton manufacturers in the Saxony district belong to an export society maintained by Saxon manufacturers, with a membership of 1100. This society receives a subsidy from the Saxon government. It furnishes lists of foreign trade opportunities to its members, recommends desirable representatives in any part of the world, maintains a credit and collection bureau, notifies its members of changes in tariffs and similar topics of interest to exporters and provides traveling salesmen who undertake to represent several members of non-competing lines on trade-getting expeditions to all parts of the world. This association distributes catalogs of its members, charging only postage. Sample houses are maintained at Dresden and Leipzig. A collection of samples of foreign raw material is maintained and a large translation bureau is a part of its equipment.

During the past six months much has been said and written about German successes in trade. So much, in fact, that no reader of COTTON today is unfamiliar with the results the Germans have attained. It is not a question as to what they have accomplished, but *how did they do it?*

The answer is simple—*by cooperation and organization.*

A STATE MANUFACTURERS ASSOCIATION FOR GEORGIA.

Georgia is to have a state manufacturers' association. Many conferences held in different sections of the state by officers of the temporary organization has culminated in a final decision to hold the permanent organization meeting in Atlanta on February 16th, 1915.

An association of this character is neither a new nor an untried venture. Sixteen states, namely, Tennessee, New York, New Jersey, Kentucky, Ohio, Michigan, Indiana, Pennsylvania, Oklahoma, Nebraska, Illinois, Iowa, Massachusetts, Minesota, Missouri and Utah now have completely organized state associations, while many other states have the matter under consideration.

A brief summary of the purposes for which this association is being organized are as follows:

To foster and encourage manufacture within the state of raw materials produced by and of the state.

To encourage a home market for state manufactures, and to assist in promoting a further trade for surplus productions with other domestic and foregn markets.

To minimize trade abuses and effect wholesome commercial relationships.

To secure, without regard to political affiliations, the enactment of just and equitable laws, safeguarding the interests of manufacturers, and to oppose any legislative measure that may be deemed inimical to the best interests of the state.

To protest against unfair freight rates and classifications and secure equitable adjustments when necessary, with a view to extending the markets for Georgia manufactured goods.

To disseminate to all its members industrial information affecting the various branches of trade in which individual numbers are interested, specifically advancing the interests of the manufacturer and incidentally promoting the welfare of the state.

To extend personal acquaintance, promote confidence and be of mutual benefit.

When finally organized and placed on a business basis this association will no doubt decide to adopt the plan now in almost universal use and equip a permanent manufacturers exhibit, although no mention has been made of this feature by the temporary officers.

The temporary officers are:

H. A. Dean, President.

W. P. Stevens, Vice-president.

Thomas K. Glenn, Treasurer.

Wm. W. Horne, Secretary.

The active organizers and their business affiliations are:

Fred B. Gordon, President Columbus Mfg. Co., Columbus.

Oscar Elsas, President Fulton Bag and Cotton Mills, Atlanta.

H. P. Meikleham, Agent Massachusetts Mills in Georgia, Lindale.

J. B. Sullivan, President Towers and Sullivan Mfg. Co., Rome.

M. F. Cole, President R. D. Cole Mfg. Co., Newnan.

Wm. Kehoe, President Kehoe Iron Works, Savannah.

George R. Lombard, President Lombard Iron Works, Augusta.

Julius Gresham, President Gresham Mfg. Co., Griffin.

S. L. Dickey, Sales Manager Dodge Mfg. Co., Atlanta.

H. A. Dean, Vice-President Towers and Sullivan Mfg. Co., Rome.

W. P. Stevens, Treasurer H. Stevens' Sons Co., Macon.

Thomas K. Glenn, President Atlanta Steel Co., Atlanta.

All Georgia cotton manufacturers should be represented at this organization meeting, as a number of subjects of vital interest to their business will come up for discussion and action. Further information and certificate of cooperation may be secured by addressing Wm. W. Horne, Secretary, Room 616 Peters Building, Atlanta.

CHILD LABOR AND EDUCATION.

The child labor conference for 1915 is now a matter of history. The staff men, the secretaries, the special agents, all flocked to Washington early in January to lay before their paymasters the record of deeds accomplished and to emphasize the urgent need of further contributions to the cause. The program, as is usual at these conferences, presented only one side of the story and progressed smoothly until David Clark, of North Carolina, editor of the Southern Textile Bulletin, rubbed the fur the wrong way by reading a paper entitled "A Demand for a Square Deal." In this paper Mr. Clark presented the actual facts in a forcible manner and despite the great antagonism these remarks aroused, they still stand unrefuted.

A few attempts at refutation were made by some of the more active officials, but in every case they chose some incomplete thought on which to base their discussion. Even the Associated Press stressed one non-essential statement in such a manner that numerous newspaper readers were largely misled as to Mr. Clark's attitude and only a few, who later had an opportunity to read the address entire, were enlightened. However much or little was accomplished by that address, the speaker deserves commendation for presenting the true conditions to these child labor enthusiasts and in a way which compelled attention.

As an echo of this debate comes the letter of Edward F. Brown, vice-president of the International Child Welfare League, Inc., to the editor of The New York Times, in which he takes issue with Mr. Clark's widely quoted statement, and declares, "It is certainly the business of the manufacturer in the North, who, abhorring child labor, is compelled to pay a higher wage to adults and consequently cannot produce his article of commerce as cheaply as the child-employing manufacturer. The injustice of this system is that it places a premium on child destruction, the unscrupulous manufacturer gaining the advantage in the marketing of his goods at a lower price than the manufacturer who pays for the hire of his adult."

This quotation illustrates another "half-truth" as the reader is instantly led to believe that the South only employs child labor. He then attempts to support his statement by the following figures from the U. S. Commissioner of Education, which he accompanies with the comment that, "while the prophecy is made that soon there will be a more or less total elimination of illiteracy among children, the progress in the South (where child labor seems to linger longest) has been decidedly slower than in the North, East and West, where child protective laws have been enacted. The figures of illiteracy among children in the southern states follow:

	Illiterate Children Per 1,000 Pop.		Illiterate Children Per 1,000 Pop.
Louisiana	115	North Carolina	68
South Carolina	83	Georgia	57
Alabama	77	Tennessee	54
Virginia	57	Florida	50
Kentucky	59	Arkansas	47

"Many of the students of this problem will trace a very direct connection between the low standard of protecting children in industry and the high illiteracy figures.

"Compare, on the other hand, the proportions of illiteracy in the North, East, and West with those of the Southern states:

Delaware	4	Idaho	2
New Hampshire	1	Connecticut	1
New Jersey	2	Dist. of Columbia	1
Missouri	11	Massachusetts	1
Montana	1	Minnesota	1
Oregon	1	North Dakota	1
Vermont	2	Utah	1
New Mexico	69	Washington	1

Child labor and compulsory education may be interrelated, but should not be confused. A law preventing the first will not enforce the second. On the other hand, a law enforcing the second will in a large measure prevent the first. Then why is it, may we ask, that no law has been passed compelling school attendance in the southern states? Speaking for Georgia, it certainly is not because of the cotton manufacturers. They have been openly advocating such a bill before the state legislature for the last four years. No doubt, cotton manufacturers in other southern states hold the same opinion. Let us look for the true reasons, as these may tend to shed some light on the peculiar figures of Mr. Brown.

The one excuse always offered by legislators is that because of the great number of negro children who would be forced to attend school by such a law, the burden on the white tax-payer, who predominates in the South, would be so great as to cause excessive taxes and much dissatisfaction. This is no doubt true and also indicates that something besides child labor in the cotton mills is responsible for those peculiar illiteracy figures.

Let us now seek another reason. Professor E. C. Merry superintendent of Fulton County schools and chairman of the special county child labor commission, is quoted as deploring the limited protection afforded Georgia's children by the law. He based this declaration largely on conditions with which he has come in contact from time to time in his supervison of the county rural schools. He said that in some instances drowsiness and sleepiness had been so pronounced in some of the children after the hard, early morning work on the farm before the hour for school that the teachers have permitted them to sleep at their desks without molestation. This action met with no opposition from the superintendent, for the reason that he regarded it as a humane measure.

Professor Merry said further that some of the patrons of the rural schools at times keep their children out of school and destroy the efficacy of continuous study, simply that the children may help with the farm work. He commented on this situation in discussing certain of the applications that have been made to him by children for permission to work in mills and factories, and said:

'Much commiseration generally is felt for the child in the mill, but little thought apparently is given to the child on the farm. From my study of the children of the rural districts, through the medium of the county schools, I have become convinced that the farmer is as great, or a greater, offender against the rights of childhood than is the owner of mills and factories. Of course, this does not apply to all farmers. But some of them seem to have little consideration for their children, judging from the work imposed on them and the limited schooling allowed. Many of these children have to work harder than children in the

mills, and in some cases are forced to get out of bed at anseemly hours in the morning to begin their labors."

Here we have a very strong argument again a compulsory education law from the standpoint of the legislator—*the farmer vote.* It may also be remarked parenthetically, that this is the reason why the proposed national child labor law is not effective against children engaged in agricultural pursuits. It shows conclusively why no reply was attempted to Mr. Clark's query in Washington as to the reason so much "Christian duty" was being expended on 4623 North Carolina children to the complete exclusion of the other 79,656 reported as also employed in gainful occupations.

The farmer vote is powerful and must not be monkeyed with, and no one knows this better than state and national legislators.

SOME SUGGESTED LEGISLATION.

Cotton manufacturers, who are being continually harassed by state legislators of the nincompoop variety introducing bills which are worthy representatives of these legislators' bifurcated brains, will thoroughly appreciate the following suggested legislation for the proper regulation and control of farmers as outlined by a railroad official in a recent issue of the Railway Age Gazette:

That this suggested bill is fashioned after the well known style usually adopted in railroad legislation, indicates a willingness on the part of this official to share his blessings with other classes of citizens. Cotton manufacturers will no doube, be equally generous.

ARTICLE ONE—CHARGES AND PRICES.

Sec. 1. Only one price for a given commodity shall be lawful. A farmer desiring to change a price shall file a schedule thereof with the commission hereby created, which shall go into effect thirty days thereafter unless suspended by the commission at the instance of any consumer.

Sec. 2. No prices shall be increased, however, except upon due proof, the burden whereof shall be upon the farmer, that existing prices are confiscatory of his goods and gear. In its discretion, the commission may refuse to permit any such increase until a valuation by its engineers and accountants shall have been taken. In such valuation, the farmer shall have no credit for past profits invested in new fields or improved structures, but shall be allowed only original cost plus borrowed money invested.

Sec. 3. "Commodity," as used herein, includes all grains, vegetables, livestock, dairy articles, excepting sand, gravel and manure.

ARTICLE TWO—CONDUCT OF OPERATION.

Sec. 4. Every hired man shall work eight hours only per day, not including the Sabbath, and shall not recommence work unless he has completed a period of not less than eighteen hours of absolute rest and quiet. He shall not work on the Lord's Day, nor on legal holidays, nor on Jack Love's birthday.

Sec. 5. Every farmer shall hire one more hired man than his work requires.

Sec. 6. The only permissible exceptions to the two foregoing sections shall be periods of stress resulting from earthquake, Halley's Comet or European invasion.

Sec. 7. All wagons, and all poles and double-trees, shall be provided with couplers, coupling by impact, so that the hired man need not go between the wheels of the wagon and the heels of the horses.

Sec. 8. All wagons shall be supplied with suitable brakes, grab-irons, stirrups and platforms of standard dimensions to be fixed by the commission.

Sec. 9. All bulls, when moving on the highway or in unfenced areas, shall be equipped with a bell of not less than fifty pounds weight, a steam whistle and an electric headlight of at least 1,100 candle power.

Sec. 10. Sheds shall be built over all fields where hired men have to work in summer.

Sec. 11. All field engines and machinery shall be fenced in; all belting shall be encased in metal housings; and all grindstones, churns, hay-cutters, bulls' horns and other moving parts shall be strongly encased in sheaths for the protection of the hired men.

Sec. 12. All barns, sheds and other outbuildings shall, in cold weather, be adequately heated, and at all times shall be well lighted and policed.

Sec. 13. If a calf is delayed in arriving or is born dead, the farmer shall instantly provide another cow whose calf shall be born that day.

Sec. 14. The commission's inspectors shall weekly inspect all gasoline automobiles. If a cylinder is missing, the farmer must find it before he runs on the road again.

Sec. 14-a. The right to mortgage real estate is a franchise reserved to the state. No farmer shall make any mortgage nor incur any indebtedness extending for a period of more than one month, without the written approval of the commission, obtained upon petition and hearing, and upon paying the state treasurer 10 cents for each $100 of such indebtedness. Indebtedness incurred without such consent shall be void.

ARTICLE THREE—THE COMMISSION.

Sec. 15. To enforce this act, a commission of five persons shall be selected by the governor with a view to placing as many shades of political opinion as possible. No commissioner shall, however, be deemed disqualified by lack of previous political or other experience.

"MADE IN THE U. S. A."

The "Made in the U. S. A." Industrial Exposition to be held in the Grand Central Palace, New York, March 6th to 13th, will embrace a complete and diversified exhibition and demonstration of "American Made" goods and "American Grown" products in practically all fields.

Special campaigns will be conducted to augment the number of buyers visiting the city this year at the time of the exposition.

The exposition will be held under the auspices of a committee of leading manufacturers and merchants and its management is in the hands of Harry A. Cochrane, with executive offices in the Fifth Avenue Building, New York. Mr. Cochrane has been selected in view of his previous successes in trade show and industrial exposition organization and management.

The "Made in the U. S. A." Industrial Exposition is designed to answer a two-fold purpose of value. It is not only to stimulate American trade to domestic and foreign buyers, but to educate the American consuming public to our resources and show, particularly, goods than can be obtained from our manufacturers that the American people themselves have heretofore been obtaining from abroad.

THE MOUNTAIN "IT CAN'T BE DONE."

BY A. M. OLIVER.

Things are moving so fast nowadays that people who say it can't be done, are interrupted by someone doing it.

One very large, if not the largest, obstruction along the road to efficient and scientific management in the mill is the mountain "It Can't Be Done." This mountain is built principally of old employees, old methods, old and out of date ideas, old machinery and lack of experience in other plants. The mountain varies in height according to the size of the plant and the method of management. I have invariably noticed that the mountain is not set upon a firm base and time after time this foundation crumbles under pressure. Many men have caused it to fall and many more men will continue to shatter it daily.

How often in our daily life do we hear the statement, "Oh, it can't be done?" How often that statement is made by men who have spent their lives doing something one way. They firmly believe that there is no better way; they believe that to try another way only means failure; and strange as it may seem it is nevertheless true that in almost every case where I have installed or introduced the installation of a new and better method, I have been unable to induce the old employee to say it is better. If the new method would produce 100 per cent more work I would only receive this gratifying remark which seems to be characteristic of old employees, "Well, I suppose if the management wants it done that way they are going to have it."

This was very well demonstrated in my own case some time ago when I had occasion to make a tandem run through three different rooms and thus do away with 21 men. The "Can't Be Done" committee immediately got their heads together and proved that it was impossible. This committee, if it can be called such, was made up from overseers, second hands, fixers and machine men. When we had completed the tandem and had it running we still failed to convince the committee with the result. The only argument, which by the way, is the one old standard argument used in all bleacheries and mills where finishing is done, was offered: "You will spoil the finish on the goods." We didn't spoil the finish and we thereby climbed the mountain once more. The committee of knockers faded away like the roses after a frost. This is but another instance where the foundation had to be blasted in order that a change could be made.

It is amusing to hear the old timers tell about how they started to work for about 60 cents or 70 cents a day and how much work they were obliged to do. I trust the reader will not gather the idea that I am not in sympathy with the old hands, for I hold the highest regard for long service. These men, however, believe they have been taught the *one right way*. They don't seem to stop and consider that there is often more than one way to reach a desired result. A clerk I used to know told me that she always carried her decimals out four places when figuring an operative's wages. This same clerk failed to show even the superintendent why it was of any value when the wages were figured daily. However, she said that was the way she had been taught a number of years ago and if it made no difference to the superintendent she preferred to do it. It was unnecessary and the same result could be obtained with one-half the effort.

Too many people are satisfied with the old way. Edison discovered the incandescent light some years ago, but he improved on it within a year. He saw a better way, a way that was more efficient, a way to save electricity and get more light. If he had said the carbon light was good enough we would have no Mazda lights today. He is progressive; he doesn't know where the mountain "It Can't Be Done" is located.

If you intend to keep up with the pace you must shed your old ideas and get in line with the new and better ways of getting the same results. A business is simply a means to an end and the sooner you get to that end, provided it is easier and the result is as good, the sooner you will realize that you are in the parade of today.

A labor union in the state of Maine recently passed a resolution that they would not use pneumatic tools. They claimed that they were injurious to the health and caused many accidents. A committee was appointed to call on the superintendent and break the news to him. The superintendent gave the committee the surprise of their life when he cheerfully told them that they were not obliged to use the tools, but insisted that they be piled up in plain view of every workman. The men started to use sledge hammers. They continued for nine days and on the tenth day every pneumatic tool in the shop was in use. They simply had to admit that the new way was better than the old way.

Sometime ago I was working on efficiency development in a mill and was asked by the management if I could devise some method of making the yarn run better from the creels through the warpers. It was true that the yarn was running poorly, and it was also true that much of the trouble was due to poor yarn. I discovered that about 24,000 yards was wound on each spool before it was taken from the spooler frame. I also noticed that nine-tenths of the yarn breaks were within five inches of the creel. It occurred to me that there was too much tension brought to bear on the yarn and I proposed that instead of winding 24,000 yards on a spool that we wind but 12,000. This immediately reduced the amount of tension and the warper tenders had less than 50 per cent of the breaks experienced before the change was made. I had to convince the "Can't Be Done" committee, however. It was another case of knocking the bottom out of that mountain and it was done. As I have said, business is a means to an end and it is better to not make the end more prominent than the business. If you cannot agree with the man who has a better and more efficient way, don't get on top of the mountain and shout it can't be done. If you do you may be under the ruins when the bottom falls out.

Umbrellas constitute one of the most important articles of import into India, as they are used by Europeans and natives. While their use is largest during the monsoon periods, yet they are also employed to a great extent, especially in southern India, for protection against the tropical sun. Among well-to-do natives, like those belonging to the Parsee community in Bombay, for whom custom and race traditions prescribe a style of headgear that does not give adequate protection against the sun, as do the topees or sun hats worn by Europeans, umbrellas are commonly carried in fair as well as rainy weather.

How To Promote a Cotton Mill

BY J. E. SIRRINE.*

In many southern communities the question is being asked, "will a cotton mill pay here, and if so, how can we get one?"

The first part of the question can be easily answered in the affirmative, provided the mill is designed to suit local conditions and is properly equipped and operated.

The second part of the question is the one that is troubling most of the communities where the industry is new, and where the business men are not familiar with cotton manufacturing. It will, therefore, probably be best to answer the last part of the question first, assuming for the moment that whatever is done will be properly done.

The first step in the building of a cotton mill is the raising of the necessary capital, and this is where most of the Southern communities are confronted with a rather serious problem.

In years past many enterprises of this character were fostered, or at least made possible, by the textile machinery builders and cotton goods commission houses, who have taken, in the past, a great deal of stock in southern mills, or have extended them very liberal terms in payment for machinery. Unfortunately, the result of this procedure was to launch a great many enterprises without sufficient capital, or with men at the head of such enterprises who were unable to make them pay.

As a consequence, many of the southern mills have not succeeded to the extent they should by reason of their large debts, or for lack of proper business management. A cotton mill, like any other manufacturing or business enterprise, must be properly operated and managed, or it cannot succeed.

Under present conditions, therefore, it is very advisable, if not absolutely necessary, to have a sufficient local subscription to pay cash for everything that goes into the plant, and while some help may be secured from the commission houses, the capital obtained from this source is usually needed for operating purposes, and should not be depended on to take care of construction needs.

The amount of capital required will, of course, vary slightly with local conditions, and quite largely with the class of goods to be manufactured. At the present time, machinery and building materials can be had for extremely low prices, and it is therefore possible to build a mill of, say 25,000 spindles, completely equipped on print cloths, for approximately $20.00 per spindle. If coarser numbers are to be manufactured, the cost will be increased somewhat in proportion to the difference in weight of the cloth. For light ducks, or extremely coarse sheetings, the cost will probably run to $30.00 per spindle, and for such goods as four yard sheetings, requiring numbers 20 to 23 yarns, the cost may be roughly figured at $25.00 per spindle.

These figures include land, buildings, tenements, warehouses, steam plant, fire protection, heating, lighting, moistening, textile machinery and supplies, but do not include anything for welfare buildings, or for store or special buildings.

If it is found possible to raise the necessary capital, the next step in the organization would be to select an engineer and commission house, and by advice from these two sources, determine upon the character of goods that can be made to the best advantage in the particular locality under consideration.

This last question has three important factors to be considered. First, the class of cotton available in the local market. Second, character, and relative cheapness of the labor supply. Third, proximity to a goods market.

It would be manifestly unwise to attempt to manufacture very fine goods in a community that raises only short staple cotton, unless that community has a bountiful supply of skilled or cheap labor, and therefore, the question of what class of goods should be made, should be determined after a thorough investigation of local conditions.

As a general proposition, the coarser the fabric, the smaller proportion labor bears to the total cost, and therefore in a community that raises a large amount of cotton, but where labor is difficult to obtain or is high in price, it is generally advisable to manufacture a fabric where the cost of cotton is a large proportion of the total cost. On the other hand, if all the cotton has to be shipped in, or a large part of it, and the labor supply is both cheap and abundant, it will probably be wise to manufacture a class of goods requiring a large amount of labor and a very small amount of cotton.

In some of the southwestern cotton growing states, notably, Texas, and Oklahoma, the chances are that a mill on light ducks, or very heavy sheetings, would be very much more likely to succeed, than a mill making print cloths, for the reason that any disadvantage that they may have in the cost of labor on coarse fabrics, will probably be offset by the difference in the price of cotton. It is also true that a large amount of light duck is used in western states, and could be shipped direct to the consumer at a lower freight rate than could be secured by the mills farther east. It is also true that a large part of our heavy sheetings is exported to China and the Philippines, and the mills of the west could probably ship via the Panama Canal, or overland to Pacific ports, with some freight advantage.

After the question of the class of goods is decided and the necessary capital raised, the organization of the company can be completed, in accordance with the laws of the state where the plant is to be located, and the actual work of building begun.

At this point, the skill of the engineer is called into play, and the question of whether the choice of engineer has been a wise one, will have a very important bearing on the success or failure of the enterprise. There are many questions of detail to be decided in the construction of a mill, and it is impossible to give any general rules that cover these details, but there are a few general prinicples that govern the more important matters to be decided.

The location of a plant should be such that the mill yard and village will be well drained, and where good foundations may be secured without excessive cost. As a rule, it is very important not to have a mill located in an in-

*Mill Architect and Engineer, Greenville, S. C.

corporated town, as the control of the village should be entirely in the hands of the mill corporation, and not subject to municipal interference. The cost of providing water supply and lights is usually more than offset by freedom from city taxes, and the experience of nearly all cotton mill corporations has been that they succeeded best when their affairs were not subject to the dictation of local politicians.

After the site has been selected and the mill engineer makes his definite location for village and manufacturing plant, he prepares a sketch machinery plan which gives the location and number of each kind of machine, and determines the form and size of the building to be constructed. A list of machinery is then made out, upon which the company can secure quotations, and the preparation of the building plans is begun. The making of a complete set of plans usually requires about four weeks, during which time prices on machinery can be obtained.

After building contracts are let, the work should be carefully supervised in every detail until its completion, and no important step should be taken without the advice of an expert engineer. Few people realize the many and varied duties which the mill engineer is called upon to perform in constructing a cotton mill plant, and a great many people have the impression that his work is practically completed when the building plans are prepared, whereas, as a matter of fact, when he gives the client the service that ought to be given, his work is hardly begun at that point.

The engineer must not only be capable of advising as to all matters connected with the building and textile machinery, but he must also be thoroughly equipped to design the power plant and to handle economically the distribution of the power.

The kind and character of power plant is another question which involves careful study, and many times, thousands of dollars are wasted in the building of a power plant, which might be saved without impairing in any degree its efficiency. The highest price apparatus is not always the most efficient, and conversely, the cheapest in first cost is not always the most economical to buy.

It may be said in general, however, that no mill can compete under present conditions, without a first class equipment throughout, and second-hand machinery should, as a rule, be avoided. There may be, of course, instances in which second-hand machinery may be purchased to advantage, but they are very rare, and as a rule, machinery is offered second-hand because the man who had it could not operate it profitably, and if the original owner could not afford to operate it, when he already had it, it is hardly likely that another man could afford to buy it.

The manufacture of cotton cloth, simple as it may seem, and thoroughly standardized as it is, is really a complex process, affected by many things, and in the building of the plant, especially in communities where the promoters of the enterprise are inexperienced, nothing should be done without expert advice from sources that are unprejudiced, and every effort should be made to secure the highest class advisers that can be obtained, and no steps should be taken without consultation with the engineer, as many things that may seem unimportant to the layman may have a very serious bearing upon the success or failure of the plant.

Finally, if all the steps necessary in the building of a mill have been properly taken, comes the question, will it pay?

If the mill is built primarily to make money for its stockholders, and rigid economy is observed, not only in the building of it, but in its operation, it may be reasonably expected that it will pay under anything like normal conditions, but if the cotton mill is built as an adjunct to a land promotion scheme, or to boom a town, or to afford an excuse for cotton speculation, then the chances are that it will prove a failure and boomerang.

If a mill treasurer is clever enough to speculate in cotton successfully, he is wasting his time to load himself down with the details of manufacturing, and any man who knows what the price of cotton is going to be, can make money so fast, that he needs to have no other source of income. It is also true that if a mill manager does not exercise his best judgment in the operation of his plant and get the maximum production at a low cost, he will not be able to compete with the other corporations in the same line who are straining every energy to make money for their stockholders.

[*Note—This article is to be followed by an illustrated, descriptive article by Mr. Sirrine, giving more complete details of the construction and equipment of a modern cotton mill of medium size.—Editor.*]

FOREIGN EXCHANGE AND CREDIT.

BY V. GONZALES*.

Before the war, the large majority of countries were on a gold basis, that is, their different forms of money were convertible into gold on demand. Their international commercial transactions were adjusted according to the gold equivalents of their respective moneys, all referring to each other on a basis of actual gold being obtainable as final settlement.

The American dollar had an exact equivalent in all countries in proportion to the gold contained in every other unit (and to the gold value of silver in silver standard countries). Commercial rates of exchange fluctuated according to supply and demand of transfers (instruments of exchange), but rates were confined within the limits of the cost of exporting or importing actual gold (freight, insurance and delay). These limits ("gold points") only in very exceptional cases were passed. The pound sterling was worth, at par, $4.86\frac{2}{3}$, because it contained 4.86656 times the amount of gold contained in the dollar. Commercial rates fluctuated between $4.82 and $4.9065, because the cost of importing or exporting gold never was more than 4.656 cents per pound. And such was the case with all other moneys.

Now the relation has been broken, not only because transportation is uncertain, the rate of interest (delay) undetermined and rates of insurance unsettled, but because gold is not freely obtainable anywhere, except in small quantities. There is no fixed value to the dollar in the terms of any foreign money nor to any foreign money in the terms of the dollar. Market quotations have no longer any fixed limits and it is a matter of daily adjustment, according to supply and demand, and the chances each may be willing to take. Transfers of money are not avail-

*Foreign Trade Department, National Association of Manufacturers in American Industries.

able anywhere and most of the transactions are limited today to cable orders or payments converted into local currency everywhere at rates fixed by the will of dealers in this line of business.

Whether gold will be restored as a basis of money values and what relation it will have to the former units, no one can tell. It is to be hoped that after the transition period all will return to normal conditions. It depends on the duration of the war, the extent of damage and the ability of governments to adjust currencies to a gold basis.

In the meantime, we have a very serious problem before us—the adjustment of accounts contracted in foreign money. Goods sold in *francs*, whether on open account or against which drafts have been drawn, how will they be settled—in dollars? Drafts discounted by banks, coming back for want of payment will have to be taken up by drawers or endorsers. Who will be the loser in the reconversion into dollars? A group of bankers have agreed to charge only the amount paid plus interest at six per cent, but this applies only to drafts protested for non-payment and is not enforcible to all.

While the difference in rates was small no disputes arose, and holders were contented many times with receiving another draft in foreign money, which was practically replacing credit in a foreign country. But at this time when differences may be very large, and other drafts may not be obtainable, the question will give ground to many disputes.

Legal proceedings will do good to no one; it will be much better to arrive at an agreement before the case presents itself.

Limits of exchange rates in all places are no more confined to cost of transferring actual gold which is practically impossible, and just as the *franc* can drop here from a par value of 19.295 cents to 16 cents or less, the dollar in France, worth formerly at par 5.18262 *francs*, may rise to 6, 7, 8 *francs* or more. Nothing can govern the rate.

Bills drawn in all countries on other countries in foreign money are payable in local currency at the collecting bank's rate for drafts in that foreign money. What rate can a "collecting bank" fix if it has no "drawing rate," as it does not draw? Drafts against us drawn in foreign money, how will they be made payable in dollars if there are no rates fixed by the collecting bank or any other?

The countries at war and others not involved in it have decreed "moratoriums," that is, they have postponed maturities for a fixed period now, but which can be extended indefinitely. We are not at war and our payments are not postponed: what legal excuse can be given for a delay? Not long ago many debtors in Mexico pleaded for delay arguing that the rate of exchange was "too high" and asking for an extension until it becomes normal again. It did not become normal, but went higher and higher every day. The value of the dollar, which was, at par, 2.00619 Mexican *pesos* was quoted very nearly at 4 *pesos*. If the scarcity of drafts on foreign countries and the impossibility of shipping gold continues, rates may go absolutely wild, but it would not appear to be an excuse for acceptors here to delay, because of a reason that we so strongly criticized in Mexico. On the other hand, if our collections are delayed everywhere, as may be the case, should we, alone, be forced to pay in due time?

Matters of national honor and individual credit do not seem to be so much at stake now. Every country is hurt, even if as far away as we are from the entanglements of the conflict, and every country is resorting to or considering "moratoriums" as a temporary relief until conditions become less stringent. Should we alone meet foreign obligations at their natural maturity? That the debtors are corporations, the government or individuals does not alter the case. Payments due here by French merchants enjoy the benefit of the moratorium decreed in France. Would American obligations payable in France enjoy the same privilege? Or does the moratorium in France apply only to foreign obligations payable in France by French people only?

We have advocated an extension of time to all foreign debtors, as a means of relieving the situation and making trade slightly less difficult. But the string should not be pulled one way only.

Exchange adjustments, at present, are next to impracticable and only an extension, practically a moratorium, can save the good name of acceptors. In London a moratorium was decreed not because of exchange difficulties, but because of lack of money or credit to settle obligations, and while bankers there all enjoy the relief of the extension they have not thought that they should grant as much as they took for themselves.

We should begin by granting time to all, and in so doing we would be perfectly justified in asking for the same privilege.

In few words, the absence of exchange, credit and money should simply "put off" for a period the pending obligations of the whole world. We are much better off than the rest of the world, but if we become disabled, because of a quixotic pride in sacrificing our gold, who can then aid the trade in all countries during the crash and during the period of convalescence?

Domestic credit for domestic purposes is quite available here, but to maintain it and utilize it as much for ourselves as for the rest of the universe we must protect it. Our obligations, national, state, city, of corporations or of individuals, are not taken by anybody anywhere today, nor do we accept those of any other country.

It is more to the world's interest than to our own to maintain at least one country with available capital, even if it be in the form of commodities and necessities that we can supply on credit instead of gold, which after all is of no use unless there is something for which it can be exchanged.

A moratorium does not impair the character or the standing of the people nor of the country. Great Britain has not only decreed, but also extended, the moratorium, and its good name has not been impaired. It has been sufficient for the government to guarantee drafts accepted previous to August 4th, and business resumed its normal course of credit.

A commission merchant in one of the Spanish possessions informs an American consul that he desires to secure the agency for an American line of cheap and medium grade of socks and stockings. Correspodence may be in English or Spanish. For further information apply to the Bureau of Foreign and Domestic Commerce and refer to file No. 15126.

WEFT YARN INSPECTION.†

BY FREDERICK H. BISHOP*.

The struggle which is now taking place in Europe, and which is likely to result in a re-arrangement of the frontier lines on the European Continent, must inevitably have a stimulating effect upon the cotton industry of this country. We shall be called upon to supply to the world's market the cloth and yarn which has in the past been purchased from European Continental countries, and should the trouble be protracted to such an extent as to reduce production in the Lancashire district in England, the cotton mills in this country must supply the finer cloths which have heretofore been imported from that section. In meeting this demand the quality of production, as well as economy, should have careful consideration in order that the increased production of our mills may be maintained when we are again in active competition with foreign manufacturers.

It is along this line that I desire to call your attention to the desirability of inspecting weft yarn, eliminating, as far as possible, the unavoidable imperfections which come through the preparatory processes culminating at the spinning frame. For many years it has been the custom among the mills producing the best qualities of cloth to inspect their warp yarn either by the use of cleaners on their winding machines, or by the inspection of the yarn at the warper, and in some instances, the use of both operations.

Within recent years the inspector of weft yarn has received considerable attention, especially in England, where so large a proportion of the weft yarn is spun on mules. This tendency has been materially increased by the introduction of machines for rewinding weft yarn, inspecting it during the winding process, and at the same time very largely increasing the quantity of yarn for delivery in the shuttle. Another thing that has contributed to the introduction of this process is the spinning of cop yarns in mills equipped wholly for this purpose, and the sale of yarn to the weavers. The inspection of the yarn protects the spinners from criticism regarding imperfections due to the spinning process, such as lumps due to imperfect piecing of the roving, and soft places in the yarn which would not weave without breaking. As inspected yarn is wound in very compact form, there is practically no loss through the breaking down of the cops in shipment. The weavers readily pay an extra price for this inspected yarn, both for the quality and for economy of use in the shuttle, as the weavers are able to produce a much greater quantity of cloth of superior quality, and with an added loom efficiency of from 5 to 7 per cent. The waste in weaving from the inspected yarn is practically nil as against from 4 to 7 per cent. in weaving direct from cops. Under these conditions the inspection of weft yarn is becoming a very important factor among the weavers in the Lancashire district. While the conditions are materially different in this country, owing to a large percentage of weft yarn being spun on ring frames, and the fact that most of our mills are equipped for both spinning and weaving, the proposition is still worth serious consideration.

The adoption of this process of inspection by yarn mills in this country equipped for ring spinning might be of great advantage in opening new markets, enabling them to supply weaving plants with both warp and weft yarn, it being evident that the weaving mills would benefit largely through that, and at the same time fully recompense the yarn mills for the additional operation of inspection. Should this practice become general, it might naturally lead to the establishment of mills devoted exclusively to weaving,—thus obtaining the same benefits now enjoyed by the weaving mills abroad.

In the regular sequence of operations in the handling of yarn from spinning cops or bobbins for use in warps, or for other purposes than for weft, the inspecting can take place without additional handling, while the inspection of weft yarn cannot be accomplished except through the introduction of an additional operation, and the lack of of efficient mechanism for winding and inspecting the yarn at one operation mechanically, has in the past made the cost of inspection apparently outweigh the advantages to be secured; the use of weft yarn direct from the spinning frame becoming a confirmed habit for this reason alone, as it appears evident that where it is considered essential to eliminate imperfections from warp yarn, it should be equally desirable to improve the weft yarn to the same extent if possible. In the endeavor to maintain this habit, it has been possible to obtain the economic efficiency of spinning frames, as a gauge for all numbers coarser than 40 must of necessity be controlled by the shuttle capacity, thus reducing the capacity of the spinning frame and affecting the quality of the yarn. It is obvious that in the spinning of coarse numbers of weft yarn on a 1⅜-inch ring, there is not sufficient distance between the bobbin and ring to uniformly lay the twist in the yarn, and with the proper stretch, this defect being aggravated by the necessity of using a filling wind on the bobbins. Where spindles are driven at proper speed in combination with 1⅜-inch rings, and with heavy travelers, the yarn balloons and whips so much as to impair the surface quality of the yarn, the heavy pull of the traveler also having a disturbing effect between the traveler and the rolls.

In weaving cloth requiring weft yarn of coarser numbers than 36 or 40, the interior diameter of the shuttle has heretofore governed the size of the ring used in spinning; the yarn for the average shuttle of 1½-inch inside measurement being generally spun on a 1⅜-inch ring, while on the finer numbers the spinning ring or mule spindle has been adapted to best results in spinning without regard to shuttle carrying capacity; thus it is that of necessity a very coarse yarn is spun on a 1⅜-inch ring, when it could be spun better and more economically on a 2½-inch ring, and on the fine numbers pin cops are used in shuttles that could carry readily 300 per cent. additional yarn. This lack of harmony between the spinning and weaving departments of a mill, together with a loss of loom efficiency and the attendant imperfections and waste in weaving, is an important factor in considering the advantages of weft inspection.

In mills where advantage can be secured by spinning to the number of the yarn, instead of to the shuttle capacity, there is an increase of from 5 to 10 per cent. spindle capacity, according to the number of the yarn, and a very

†An address before the National Association of Cotton Manufacturers.

*Secretary Universal Winding Company.

substantial saving in the cost of bobbins. On quite a range of numbers the spinning bobbins can be gauged to hold sufficient yarn for inspection and winding, carrying about 100 per cent. of the shuttle capacity, and without knots except such as occur from taking out imperfections. The use of inspected yarn on bobbins containing 100 per cent. more than when spun on bobbins for direct use adds at least 5 per cent. to the loom efficiency. In weaving coarse counts from spinning bobbins, a large portion of the time of the weaver is devoted to the replenishment of shuttles, and this proposition holds good up to No. 40 yarn. In regular mill practice on plain cloth, weavers can attend to 50 per cent. more looms, and at the same time secure a 5 per cent. added loom efficiency. This applies to the handling of plain looms, and not to those where the handling of the weft yarn is mechanically performed. These economies of operation more than cover the cost of inspection where they can be introduced, and are cited in justification of the process of inspection as one whereby the cloth mills weaving cotton cloth can improve their output without increasing the operative expenses.

In a paper read by J. R. Horne to the British Association of Managers of Textile Work, the cleaning of yarn is taken up in detail, and many illustrations inserted regarding the different methods in use for this purpose. He stated that he had found forty-eight different patent specifications covering various types of cleaners that have been issued since 1871, and that as far back as 1856 the process had been introduced into mills for the purpose of improving the quality of yarn. Most of the illustrations of cleaners in his paper are well-known in mill practice, and include several patented and manufactured in this country. The attention given to this matter, as evidenced by the production of so many different methods of cleaning yarn, shows plainly that the object to be attained warranted such action.

The additional expense of inspecting warp yarn is incurred for the purpose of improving the quality, and no other economical result is obtained through the operation. As the winding of the yarn from spinning bobbins to spools for use in warping creels is a necessity, the application of yarn cleaners to the spoolers has not been considered an additional operation to be figured in cost, and the added expense has been included in the pay of operatives with lower production. The actual cost of inspection at the spooler averages about 25 per cent. advance of labor cost, and the use of additional spooling machines through decreased spindle speed. When yarn is inspected at the warper, the expense of inspection is substantially greater, as the time and attention of the warper tender is confined to one machine as against three on the same warps with inspection omitted.

Whenever a change in any process of manufacture is proposed, with intent to reap some economic advantage, the elimination of operation is regarded generally as being desirable if not essential, and any improvement which increases the number of operations must be of so great advantage as to offset the additional detail involved in extra handling of work or material. Perhaps this is one of the reasons why the inspection and preparation of yarn for delivery from shuttles has not kept pace in this country with the great improvement made both in the spinning of yarns and of looms for weaving. The history of the past twenty years in cotton manufacture covers great improvements in preparatory machinery and in spinning machinery, especially in ring spinning, which system today supplies so large a per cent. of the weft yarn used in this country in the cotton industry. Perhaps even greater advance has been made in the improvement of looms for increasing capacity, and the adaptation of warp stop motions for improving fabric.

The economic advantages which would accrue from the system of weft yarn inspection as installed in a new mill weaving yarn coarser than 40s., and spinning with rings adapted to the yarn, would rest upon the following points:

1. Increased production of spinning spindles by 5 to 7 per cent.
2. Saving of 50 per cent. more or less on bobbins.
3. Increase of 100 per cent. in shuttle capacity.
4. Elimination of waste at the loom.
5. Loom efficiency increased by 5 per cent., weavers to handle 50 per cent. more looms with 5 per cent. gain. Thus a weaver handling twelve looms with inspected yarn, in place of eight with uninspected yarn, will secure an increase of 12.6 per cent. loom production.

While results would vary in mills on different grades of cloth, the average gain would cover expenses of inspection and repay investment in from three to five years in a mill running non-automatic looms.

From what has been said it will be easy to compare the relative advantages on looms constructed for automatic replenishing of weft in the shuttle, the quality of product in all cases being of primary importance.

A CONSULAR REPORT FROM ANTUNG, CHINA.

To secure the trade in cotton goods, or any other American manufactured product, it will be necessary to have personal representatives in this territory. The Chinese cotton goods dealers in this locality are not large ones, and American manufacturers would find it difficult to do a profitable business with one of them as agent, unless he were under an American representative stationed somewhere in Manchuria. The Japanese, on account of their proximity, are able to handle contracts with great dispatch. American manufacturers must therefore place large stocks somewhere in Manchuria, preferably in some central territory like Changchun. The Chinese merchants here would have neither facility nor capital to handle a large stock; they do business in European and American goods through Shanghai, Darien, and Newchwang.

It would certainly not be advisabe to push American cotton goods in competition with Japanese unless American manufacturers are willing to expend as large an amount of money and energy as the Japanese who are, in many instances, selling at a loss in order to secure the trade. To push American goods in Antung at present would mean an uphill contest, with losses perhaps for several years. Such a fight might be worth while for American cotton goods manufacturers if they jointly made a determined effort and were willing to stand the loss of money and time in order to re-establish the trade throughout Manchuria. In respect to other American manufactures, the results would not, it is thought, justify the expenditure [The names of two general importers of Antung may be obtained from the Bureau of Foreign and Domestic Commerce or its branch offices.]

Mill Conditions and Market Reviews.

SOUTHERN MILL SITUATION.

In textile circles, pessimism is giving way to opitimism. Evidence abounds that with the new year general business will be decidedly better in the United States, and it would seem that normal conditions will soon obtain in the textile industry. This feeling is strengthened by the fact that additions, replacements and new building operations are being taken up aggressively, and during the last few weeks many mills in North and South Carolina and other southern states have started improving and enlarging their properties, and a number of new mills are being talked of. Nor are these reasons the only ones advanced to explain the growing confidence. It is noted that reports of the resumption of operations of southern cotton mills continue to come in from all parts of the South, and many are now running full time—in some instances have even resumed night running. So, in view of all this activity, it is held in many quarters that the middle of February will find most of the mills of the South on full time. Orders for the European belligerents are already gearing the wheels of our factories. As the largest neutral power on earth, a good many orders fall to us which never came our way before. Too, the gradual openings of the stock market will help. The new federal reserve law has strengthened the foundations of business, and altogether we may well look for decidedly improved conditions. The cotton growers will also have their problems greatly lightened by the boost given our cotton mills. In the long run, any war losses they may suffer will more than be made up to them through new markets and the heightened prosperity gained by American mills. Happily, the South is in a very different situation from that of the sixties, when its cotton was simply valueless so far as value had to be conferred by use at home; we now have an all-round economic development, and now of course there is no blockade or anything of that sort. Also the cordially helpful attitude produced in the Government toward the mills, primarily for the rescue of the growers, emphasizes the interdependence of our cotton interest, and should be of permanent benefit.

The most encouraging element just at present, however, is our foreign trade. Exports are picking up by leaps and bounds, due in great measure to liberal foreign orders for war materials and to practical resumption of cotton shipments. The textile trades have undoubtedly passed through a period fraught with difficulties and adverse conditions, but most of them now appear to be a matter of history, and the general outlook is certainly more cheerful than at any time since the war began.

In a recent issue of the New York Journal of Commerce a number of southern manufacturers voiced expressions which indicate unmistakably the firm conviction that while the war has worked extraordinary hardships, it has brought out those evidences of courage and endurance that will eventually make the industry sound and greater than ever before. A few extracts from these letters are reproduced as illustrations.

Capt. E. A. Smyth, President of the Cotton Manufacturers' Association of South Carolina: "The depression in the South in business is gradually passing. One ray of sunshine comes during the past week caused by the movement of export goods to the Orient and to the Red Sea that have been held up for months on account of the inability of exporters to forward shipments that had been ready, owing to their inability to negotiate bills of exchange, secure tonnage, or pay the exorbitant insurance rates. In addition to this, new business for export has been in evidence lately and the low price of cotton will enable manufacturers to regain largely the export trade and extend their business in other foreign countries."

S. B. Tanner, President of the Henrietta Mills: "The decline in cotton has not benefited the mills, for the reason that the prices of goods have declined more than cotton. Our home trade is not sufficient to consume the production of the American mills and the countries to which we have been exporting heretofore have been financially weak for the past season. However, American bankers are opening branch banks in South America, and we hope for good results in the cotton goods trade in the near future."

H. R. Fitzgerald, Secretary and Treasurer of the Riverside and Dan River Cotton Mills: "Business is still very irregular and in some sections is far below normal, but an adjustment is gradually going on, and with a return of confidence we believe that conditions will soon right themselves. We believe that our country is now confronted with the brightest opportunity in its history, and if every good citizen will stand by his colors and apply himself in a cheerful and optimistic spirit, the signs of activity which are already beginning to manifest themselves will soon materialize into a rapid stride forward. There is no good reason why the year 1915 should not be an active and prosperous one for this country, and we confidently expect it."

G. H. Miller, of Chattanooga, has purchased the interest of W. B. Davis in the Davis Hosiery Mills and allied interests in that city. The consideration all told was about $150,000, practically half in cash, the balance being entire ownership of the Fort Payne, Ala., hosiery mill. The trade transfers no interest whatever in the widely advertised Buster Brown hosiery. That familiar emblem was a trademark of the Davis plant and by the transaction remains with the mill instead of being identified with Mr. Davis' future operations. Mr. Davis will retain his residence in Chattanooga and will be active president of the Fort Payne mill. His son, Robert Davis, will be manager. The Alabama plant was established a few years ago by Mr. Davis and Mr. Miller.

While no definite announcements had been made by Mr. Miller up to January 5 relative to conduct of the main plant of the old Davis mill, and its auxiliary recently built in a distant suburb, it is understood that he would probably bring about large expansion in their capacity and business.

Accompanying the deal, also, reports were rife that Mr. Davis would establish an entirely new hosiery mill at Chattanooga of large proportions. He declared this rumor to be unfounded, but the report persists. In addition, there

is considerable talk that regardless of the truth of that report, he will make arrangements to finish the products of the Fort Payne plant at Chattanooga, as there are no facilities for the final processes in the Alabama town.

The business separation of Mr. Davis and Mr. Miller involved one of the largest trade deals executed in Chattanooga for some time. The Davis Hosiery Mill is one of the largest textile industries in that section, employing, when running full capacity, about 1,000 hands.

Garnett Andrews, vice-president and treasurer of the Richmond Hosiery Mills, Chattanooga, Tenn., was one of the first to thoroughly investigate opportunities for capturing trade in Latin America lost to Germany on account of the European war. Now the Richmond Hosiery Mills have developed a very valuable trade in the southern continent, and is operating day and night to fill the orders that come on every foreign mail. Besides the strong demand for imported hosiery in Latin America, two other factors combine to enrich this Chattanoga mills' trade. These are satisfactory shipping facilities and an energetic agent in South America. Rules for packing hosiery are simple. No cardboard boxes are used for unit packages, as for domestic shipments, but several dozen pairs of hose are wrapped in tissue paper and a large number of these packages are put in light, securely constructed wooden boxes. The voyage is about 24 days.

"We have the largest payroll ever maintained in the history of the mills," says Mr. Andrews. "We are operating the knitting and milling departments both day and night, and other departments at full hours now." While the hosiery trade, according to Mr. Andrews, has again assumed highly profitable proportions, the dyestuff problem has not been settled. Good dyes are approximately 300 per cent more costly than before the war impaired Germany's dye exports to America.

Other Chattanooga hosiery manufacturers are investigating opportunities for an expansion of their trade in South America. The Dayton Hosiery Mill is reported as having already gained a strong trade there, and the Davis Hosiery Mill's interest in that direction is increasing.

It is reported that J. Q. Little, Dever Little and Stanyarne Little have been to Johnson City, Tenn., with a view of erecting a large cotton mill at that place. These young men are excellently equipped as practical mill men, and the people of Johnson City are enthusiastic over the project. The advantages of this location are many, among them being that it is situated half way between the cotton and coal fields. The price of coal at Johnson City is reasonable and the freight on cotton to that point is 42 cents. The labor conditions at Johnson City are also favorable, as there are no concerns there which employ women and children. The plant will cost $500,000 and will have not less than 25,000 spindles. The Carolina, Clinchfield & Ohio railway is interested and will probably subscribe liberally to the stock, as will the Eastern Electric company of Johnson City, which owns the street car franchise and the power plant. The site of the mill will be at the junction of the C., C. & O. and Southern railways just outside the city limits.

Austin, Texas, is in the market for a cotton mill and reports from there indicate that they have cheap power, convenient cotton fields producing 500,000 bales annually, and are willing to aid financially.

Additions and replacements among southern mills are noted as follows:

The Bibb Mfg. Co., Macon, Georgia, have placed their order for a large amount of new machinery, including pickers, cards, drawing, roving, spoolers and twisters.

The Whitney Mfg. Co., at Whitney, S. C., are planning to add 40 spinning frames and 14 roving frames, order for these having been placed.

Unity Spinning Mills, LaGrange, Georgia, have contracted for 14 new cards and one new roving frame.

West Point Mfg. Co., West Point, Ga., are preparing to receive four new single flier speeders recently ordered.

Order has been placed by the Fulton Cotton Mills, Athens, Ala., for two camless winders.

The General Asbestos & Rubber Co., of Charleston, S. C., are planning to build a textile mill, a small two-story building having been decided upon.

The Inverness Mills Co., Winston-Salem, N. C., has placed an order for 24 new Stafford looms.

The Riverside Mfg. Co., of Castle Hayne, N. C., has been incorporated, capital stock being $25,000. H. L. Vollers, W. A. Mahler and D. MacEachern are the incorporators.

The capital stock of the Sylvan Cotton Mills, Shelbyville, Tenn., has been increased from $72,000 to $90,000. This is for the purpose of enlarging the company's plant. They now have 4440 spindles, and manufacture osnaburgs, drills and brown sheetings.

The Board of Trade, Savannah, Ga., are endeavoring to have a new hosiery manufacturing plant located there. Thomas Purse is secretary of the Board of Trade.

A charter has been granted the Kings Mountain, (N. C.) Manufacturing Company, the capital stock being $95,000. W. A. Mauney and J. S. Mauney are the principal incorporators.

The contract for the looms for the 15,000 spindle addition to the Erlanger Mills, at Lexington, N. C., has been placed.

The Icard Mfg. Co., at Icard, N. C., near Hickory, has been incorporated with capital stock of $125,000, by D. B. Null, Stanley Ferry and A. L. Wilson, all of Connelly Springs, N. C.

It is reported that J. K. King and Hubert Murray, both formerly connected with the Massey Mills, of Columbus, Georgia, are organizing a company for the establishment of a hosiery mill in Columbus. They expect to manufacture about 350 dozen pairs of hose per day.

The Old Dominion Knitting Mill, of Williamsburg, Va., has been incorporated with an authorized capital stock of $15,000, the intention being to manufacture knit goods. The officers of the company are: John McGinnis, president; Edmund Fain, secretary and treasurer, both of Williamsburg.

It is reported that I. J. Nathan, proprietor of ice and light plants at Marlin and Rosebud, Texas, would like to get in touch with some one who has capital or machinery and who would take stock and assist in the promotion of a cotton mill in that section. A letter addressed to the secretary of the Commercial Club of Marlin, Texas, will secure full details.

At one time taxes were collected at the point of the bayonet. We have, however, improved since those days. Instead of lounging in some jail, we may have the privilege of sitting upon the sidewalks, surrounded by our goods and chattels, and breathing in the fresh air of heaven.

NEW ENGLAND MILL SITUATION.

Business in cotton goods has improved in a very marked way since the first week of this year and there is a much better sentiment among manufacturers. The prices at which considerable business has been done have not been profitable, based on the cost of cotton at the time the orders were taken, but the mills had been buying some cotton from the opening of the season and the disposition of merchants and manufacturers has been to stimulate trading wherever possible by making the lowest values commensurate with conditions. The improvement that was forecast in the improving demand for wide print cloths was finally seen in all domestic lines when new values for the fall season were placed on cotton blankets and other napped cottons.

Contrary to the usual custom of late years, the prices on Nashua cotton blankets were made before the production was placed under order in any degree. These prices were materially below what other blanket manufacturers were looking for, but from the start of the season's trading they touched the bottom values that buyers could expect and soon led to the placing of full orders by the jobbers who were ready to proceed. Several jobbers were unable or unwilling to commit themselves on goods to be delivered six or nine months ahead when they still had many back bills to pay, and while there was still grave uncertainty concerning the possible volume of distribution.

These uncertainties were dispelled in a large measure by the fact that prices were named low enough to protect any buyer, and by the other fact, that competitors of the leading manufacturers did not want to cut prices any deeper. There is warrant for saying that the business of the larger producers is fuller than a year ago on the staple lines. It has been growing decidedly better on all the fancy products used for rugs, bath robes, etc.

Prices on the fancy flannellettes were named on a basis of 1 to 1¼ cents a yard lower than a year ago. In one instance the prices were 2½ per cent lower than in 1911, the last previous year of low cotton. These low prices served to place many of the best known New England brands of fine flannelletts within new jobbing and retail price ranges and consequently led to the placing of larger orders than have been given in recent years. The price cutting that followed on the lower grades has not affected the New England lines as much as in some years of close competition.

The leading manufacturers of fine dress ginghams and of staple ginghams decided to make no reductions in price for the spring and fall season. The orders that came in on staple ginghams were surprisingly large and showed that stocks had been reduced greatly in anticipation of a sharp reduction. Had the dyestuff outlook been normal such a reduction would have been made. It was found that even if dyestuffs supplies were likely to come in, the prices asked for them were so high that mills could not assure themselves of profit if they dropped the prices on goods in keeping with the drop in raw cotton. By standing pat the manufacturers expected to lose considerable business to southern mills whose staple lines were dropped a couple of months ago. The buying assumed such proportions that southern mills were unable to advance their prices and New England mills are now holding firm and are well supplied with business for two months to come.

The dress gingham business has been good on the lines that retail for 10 cents a yard. It has not been so good on the other lines, particularly on the goods of the AFC character. There is a fair business coming along on other yarn dyed specialties made in the smaller gingham mills, but it is being placed in small lots. The impression among gingham manufacturers is that fashion will favor the cloth before the spring and summer selling season is very far advanced.

Wide print cloths are from ¼ to ½ cent a yard higher than the low point of last year. Sales this month have been active. In one week Fall River disposed of 350,000 pieces, the largest week's sales in more than six months. Stocks at that centre are now declining and the February contract sales will prevent any further accumulation for some time. Narrow print cloths are in fair demand. Narrow prints were advanced to a basis of 4¾ cents for American standards on January 18th and other lines were also advanced. There is a movement afoot to force an abandonment of the policy of protecting the jobbers against price reductions on staple prints and it is thought that it will be successful.

Bleached cottons have been in steady demand, the buyers giving preference to the better known brands and to the finer counts. Fruit of the Loom goods have been advanced to a basis of 7¾ cents. They sold as low as 7½ cents last year. Wide sheetings are firmer and about 2½ per cent higher. Pillow tubings are comfortably sold ahead. There has been better business than for some time in some of the choice New England brands of brown sheetings and drills. The inquiry for export has been generally light.

Staple tickings were reduced from 13 cents to 11½ cents a yard for 8 ounce goods and large orders placed. There were some less drastic reductions on denims and other coarse yarn colored materials. Colored duck in 10½ and 12 ounce weights has sold well for tentage purposes and substantial quantities are being exported to the countries at war. It is now pretty generally known that converters and manufacturers of various duck materials have secured a very full line of orders from abroad, and the figures of shipments of goods of this class are becoming formidable. The most substantial business for export in regular channels has come from India, about 3,000 bales of drills having been sold on a basis of 6¾ cents for standards.

Business on fine and fancy combed yarn cottons has not been up to expectations although in the last week of the month the demand was broadening. The anxiety of manufacturers to sell goods and the pressure of converters to secure business on goods they have had in hand since late fall, following the hurried finishing when dyestuff scarcity was much talked of, have led to free reductions and to many irregular quotations. The consequence has been that mills have found it difficult to see a profit on the business offered to them on repeat orders as well as on orders for many of the fine plain combed yarn staples. The New Bedford mills were laying weavers off a month ago but are now beginning to re-start machinery again.

The volume of business tendered on silks and cottons and on embroidered voiles, crepes, and dotted swisses has shown a steady gain this month. The absence of a normal demand for heavy piece dyed cottons on the poplin order has been felt greatly in the mills. There is now coming forward a demand for gabardines, and serges in cotton.

and the high prices asked for all worsted or mixed goods will probably help in the distribution of cottons of this character. The white goods business has been coming forward in small lots. The volume of trade on india linons is larger than it was a year ago, but there has been no one line of fancy goods that has been selling in much larger relative proportion than usual.

In the past few weeks there has been some slight improvement in the demand for American made laces, and the lace factories in this section have been re-instating men who have been idle. Some of the fancy fine yarn dyed weavers are also getting considerable more business on goods of swiss construction, small dots and figures being preferred. There has been a steady business on tire fabrics and now there is a better demand being reported for many of the miscellaneous wares in tapes, braids, and other goods that have been dull for months past.

Business on bedspreads has been better this month than for a long time. New light weight fine lines with jacquered designs are being brought out for late spring and fall delivery. This departure in construction will probably result in the exclusion of many foreign goods that have sold here because of their fineness and light weight, rather than because of any superiority in design or finish. One mill has all of its quilt looms in operation and others whose looms have been 50 per cent idle are now getting an increased business.

The large finishers and printers who have been running short time are slowly getting more machinery in operation. The average of employment in different concerns is very irregular. The Sterling branch of the U. S. Finishing Company, for example is running in full, while other finishers of black goods are doing less than half of normal. The Windsor and Arnold Print Works have been very busy, while the Pacific, American and Algonquin have been running short. But in nearly all instances, improvement in the past two or three weeks has been steady and it promises to continue.

In the mill machinery shops business has been about as dull this winter as it has been in 15 or 18 years. Within two weeks there has been some revival of interest in new equipment on the part of old concerns and it is believed that before spring opens there will be some new developments, particularly if money continues easy. One factor in favor of new hopes among the machinery men is the very low price that can be quoted now for new contracts. The easier prices in raw materials have helped, and there has also been sufficient idleness among workers to make production more efficient. It may be many months before normal activity is restored, the machinery men think, but they are certainly feeling more confident than they have at any time in the past year.

COTTON COMMENT.

BY H. AND B. BEER, NEW ORLEANS.

New Orleans, January 23rd, 1915.

One month ago we advised the American spinners to take advantage of the opportunity to provide for their future wants of raw cotton at the low prices then prevailing, and recommended the buying of cotton two months ago when values were down to the lowest levels of the season, and expressed the opinion that the low prices then prevailing were the lowest for many years past, and would probably be the lowest for many years to come.

Compared with one month ago values are about $5 per bale higher, and are nearly $10 per bale above the low levels touched in the fall. It appears, however, that the American mills have been slow in buying for their future requirements, as their stocks on January 1st were 387,000 bales less than last year, whereas on December 1st their reserves were 366,000 smaller than on the corresponding date of last season. On January 1st, the mills of the United States held a stock of 1,342,000 bales compared with 1,729,000 last year.

By pursuing this policy while the price of cotton is below the cost of production, American spinners are showing a lack of acumen, as indications are that the value of cotton will be higher later in the year, due, in all probability to a big decrease in the cotton acreage in the spring.

Foreign spinners, despite the war in Europe, have bought largely of contracts and of spot cotton for their future as well as their immediate requirements. This demand is reflected in increasing exports. Shipments to Europe since August 1st are 3,359,000 bales, and will probably be nearly 5,000,000 bales by March 1st, and may total 7,000,000 bales for the season, whereas when the war started it was generally believed that exports this season would not be one-half of last season's 8,884,000 bales.

In times of peace, Liverpool, Havre and Bremen were the distributing cotton centers for Europe. This year, owing to the war in Europe, the whole world has looked to the South for its supply of cotton, consequently the demand for cotton from all quarters of the world has been very urgent in the South, and farmers are taking advantage of the situation by advancing prices.

The reaction of about 40 points, or $2 per bale the past week, was occasioned by today's Census Bureau report showing more cotton ginned to January 16th than generally looked for—14,908,000 bales vs 13,582,000 last year, and 14,516,000 in the previous crop season of 1911-12. The quantity of cotton ginned during the last period, January 1 to 16, was 460,000 bales against 234,000 for the same period last year and 199,000 for the corresponding period of 1912.

It is generally conceded, however, that the crop is a very large one, probably 16,500,000 bales including linters, but the price of cotton is about 5 cents per pound lower than it was at this time one year ago, a difference of $25 per bale in favor of the spinner, not only compared with the average price of last season, but with the average price of the past five years, which was about 13 cents per pound.

In view of the low price of the staple and the high price of grain, southern farmers are growing more foodstuffs, and will probably plant much less cotton in the spring. According to government reports the increase in the wheat area in the South is 2,000,000 acres, and the increase in the area of oats in the cotton region is 2,000,000 acres. As corn is the largest of the grain crops raised in the South, the increase in the corn acreage in the southern states this spring will probably be very large. This big increase in grain crops in the South will probably be at the expense of cotton.

We consider the price of cotton very low still, expect a good foreign demand for some time to come. Therefore, we still favor buying, as we look for higher prices eventually.

Following is the U. S. Census Bureau report of cotton ginned prior to January 16th, 1915, exclusive of linters:

	1915	1914	1913	1912
Alabama	1,676,081	1,475,154	1,307,736	1,638,699
Arkansas	941,681	967,687	741,282	797,597
Florida	88,113	65,765	57,324	88,177
Georgia	2,596,842	2,314,101	1,781,232	2,657,984
Louisiana	434,479	42,384	369,076	357,758
Mississippi	1,143,703	1,176,539	952,920	1,061,859
North Carolina	853,830	783,817	875,493	996,998
Oklahoma	1,147,497	825,069	965,752	915,563
South Carolina	1,425,768	1,368,774	1,192,574	1,536,085
Tennessee	342,982	358,725	252,890	386,293
Texas	4,120,904	3,715,418	4,509,220	3,964,620
All other states	136,062	111,053	83,831	114,176
United States	14,907,942	13,582,036	13,088,930	14,515,799
Ginned Jan 1 to 16th	460,519	234,315	181,527	198,797
Pct. crop gn'd to Jan. 16	(?)	97.1	97.0	93.3
Total season's gin'ngs	(?)	13,982,811	13,488,539	15,553,073
Total season's linters	(?)	631,153	602,324	556,276
Commercial crop	(?)	14,977,000	14,173,000	16,069,000

THE YARN MARKET.

The yarn market for January has been rather a disappointing one. The expected improvement in the demand for yarns that was due around the middle of January failed to materialize. The prices, however, were stiffly held, and if anything, had an upward trend. This action on the Philadelphia market, however, is not to be taken as a criterion for the entire trade. Many mills are manufacturing yarns steadily and are selling them as fast as manufactured, and in some instances are considerably oversold and the mills are running night and day with two shifts of operatives. Facts like these do not usually appear in the market discussions.

At the beginning of the month, there was some signs of improvement noticeable in the demand for combed yarn. However, combed yarn in the Philadelphia market has been very dull for a considerable period and any movement at all could be classed as an improvement. Southern frame spun single combed peeler were sold at this time on the basis of 19 to 20 cents for 10's. There were also a few sales of eastern mule spun yarns on a basis of 20½ cents to 21½ cents for 10's. There was some little improvement in the demand for mercerized yarn, while the weaving line remained practically unchanged.

In the Boston market, purchases by electrical manufacturers were followed up by further buying of a similar nature. This trading involved some single 100's combed sea island yarns. The tire duck weavers were also taking yarns quite freely on old contracts and the specifications indicated considerable activity on the part of such mills. Underwear knitters in the Boston markets continued to buy yarns very sparingly. However, New York State knitters were in the market for 10's, 12's and 14's singles. Prices in the Boston market advanced slightly during this period.

Toward the close of the month the New York future cotton market went upward and spinners gradually boosted the prices of their yarns; 10's southern frame spun carded cones were quoted one day for 15 cents, the next morning for 15¼ cents and before night were 15½ cents. Prices for 24's cones rose from 18 to 19 cents in one week's time. There were a few sales made on the basis of 15 cents for 10's and sales of 20's were made at 16¾ and 17 cents; 24's sold at 18, and 26's at 18½ and 19¼ cents. The knitters seemed to have a tendency to balk at paying the increased prices asked by the spinners and confined their orders to what was absolutely necessary. The demand for mercerized combed yarn was confined to small quantities.

In the weaving lines, while there were spots in which improvement was reported, there was nothing that could be classed as a general improvement. The sales of weaving yarns were largely in small quantities but the prices were on a gradually rising basis. Dealers received quite a number of inquiries for weaving yarns ranging from 14's single warps to 40's 2-ply warps in chains, generally, for March or later deliveries, but the gradually advancing prices of the yarns checked any large buying.

The demand for 2-ply combed yarn still continued small and with prices rather irregular; 60's 2-ply combed Egyptian sold for 47 cents; 40's 2-ply combed peeler skeins sold for 31 cents; 60's 2-ply combed peeler on cones sold for 41½ cents, 43 and 44 cents; 50's 2-ply sold for 36 to 38 cents.

Taking all in all, the future prospects for the yarn market were brighter not only as regards a better price for the yarns, but it is also evident that the yarn users must buy in larger quantities sooner or later. The following are recent quotations from the Philadelphia market:

Southern Single Skeins.

4s to 8s	13 @13½	20s	15 @15½
10s	13½	24s	16
12s	14	26s	16½
16s	14 @14½	30s	18
16s	14½ @15½		

Southern Two-Ply Skeins.

8s	13	24s	16½
10s	13½	26s	17
12s	14	30s	18
14s	14½	40s	23
16s	14½ @15	50s	30 @30½
20s	15½ @16	60s	35

Carpet and Upholstery Yarns in Skeins.

9-4 slack	14½	8-3-4 hard twist	13 @13½
8-4 slack	14½		

Southern Single Warps.

8s	13 @13½	24s	16
10s	13½ @14	26s	16½
12s	14	30s	18
14s	14½	40s	23 @24
16s	15	50s	30 @31
20s	15½		

Southern Two-Ply Warps.

8s	13	24s	16½ @17
10s	13½	26s	17 @17½
12s	14 @14½	30s	18 @18½
14s	15 @15½	40s	23 @25
16s	15½ @16	58s	31
20s	16 @16½		

Northern Two-Ply Carded Peeler Skeins.

22s	17½	36s	22
24s	18	40s	23 @25
26s	18½	50s	31
30s	19	60s	35

Two-Ply Combed Peeler Skeins.

20s	22½ @23	50s	36½ @37
24s	24½	60s	41 @42
30s	27 @27½	70s	47 @50
40s	31½ @32	80s	60 @63

Southern Frame Spun Yarn on Cones.

8s	14 @14½	20s	17
10s	14½ @15	22s	17½
12s	14½ @15½	24s	18 @18½
16s	15½ @16	26s	18½ @19
18s	16½ @17	30s	19

Northern Mule Spun Carded Yarn on Cones.

4s to 8s	15½	20s	18½ @19
10s	16 @16½	22s	19
12s	16½ @17	24s	19½
14s	17 @17½	26s	20
16s	17½ @18	30s	21
18s	18 @18½	40s	23

Northern Mule Spun Combed Peeler Yarn on Cones

10s	20½ @21	22s	24 @24½
12s	21 @21½	24s	24 @25½
14s	21½ @22	26s	25½ @26
16s	22 @22½	30s	29 @29½
18s	22½ @23	36s	31 @31½
20s	23½ @24	40s	33 @34

A firm in the United Kingdom informs an American consul that it wishes to be placed in touch with manufacturers in the United States of children's cot blankets made of waste cotton. The sizes of blankets in demand are 30 by 40 inches and 36 by 50 inches, colored blue or pink, with animal decorations. Quotations should be made in English currency, and through rates to destination, if possible, otherwise f. o. b. New York. It is explained that the usual terms of payment are cash in 30 days. The Bureau of Foreign and Domestic Commerce will furnish further information on application. Refer to file No. 14297.

THE KNIT GOODS MARKET.

Knit goods in January showed a slow but general improvement. As indicated in earlier reports many knitters were driving their machinery full capacity night and day and still unable to keep up with orders. This refers only to some special industries, however, and did not include the entire general line of knit goods manufactures. January saw an increase of orders from jobbers for light weight underwear and some lines of hosiery. The improvement in the raw cotton market no doubt had a tendency to start buyers going on orders.

One of the interesting events of the early part of the month was a naming of prices on men's cotton fleeced underwear. Some of these prices were understood to be from 25 cents to 42½ cents a dozen below the prices of a year ago.

The annual convention of the knit goods jobbers at the Waldorf Astoria brought out several interesting features, among which was the more optimistic view of the future on the part of the majority present. They seemed to believe that the change for the better had arrived and that good business could be expected this year. Frank L. Chipman, of Charles Chipman's Sons, hosiery selling agents, in an address entitled "Thirty Years' Retrospection and Prospects in Hosiery," expressed a belief that in the near future there is to be a wonderful revival in business. In discussing the changes in the distribution of knit goods covering the period of which he was speaking, he said that very few realized the completeness of the modern American jobbing house. In this connection he told of some personal experiences that were of particular interest. We quote as follows:

"If you had been with me on a tour of the jobbing houses of London last year, you would then appreciate the advancement made in this country over foreign competitors. In one of the largest houses in London I counted thirty young men with large baskets on their shoulders carrying goods down rough stairways to the basement to be packed. There were only two elevators in this immense establishment, carrying two passengers each, and kept exclusively for customers. The buildings of all the London jobbers are antiquated, rough floors, combinations of small rooms, and I failed to find one house or institution any better, or equal, to ours of thirty years ago. The same applies to Paris; there are very few jobbers in France, most of the business being done direct with the retailer, and I am sure that those who are there are thirty years behind any department represented here.

"In Brazil I found the domestic hosiery business in about the same condition that existed here twenty years ago. I visited their mills and they were still making (in some of the mills) the old cut hosiery. Few of the poor people in Brazil wear hosiery, and the inhabitants of the cities being Portuguese and Spanish still wear fancy stripes, both in women's and men's hose, which would be unmarketable here.

"Of course the craze for silk hosiery has reached the South American countries, and the better class of people are beginning to call for them. The duty, however, on the 50 cent silk hose in Brazil is approximately $10 a dozen. The manufacturers sell seamless cotton hose for 33 cents per pair—which is their dollar—and would sell in this country for 12½ cents. The duty, however, is something like $1.35 per dozen on 1 pound 10 cotton hose, so it entirely excludes American goods of this class.

"Uruguay's population of 1,280,000, 98 per cent white, is the most prosperous of all South American countries, and is a good market for its size, having no hosiery mills.

"I found in Argentina that the jobbing houses were right up to date and their business methods on a par with ours. Large quantities of cheap German fancy hosiery are imported and very creditable cheap staple goods are made in the country; such as the Nelson and others are made in quantities and compare favorably with American manufacture. The duty, which is from 50 to 97 cents a dozen, excludes American goods of this character.

"At 12 o'clock each day every one leaves the business establishment, the doors are locked, and no one remains in the house save the watchman; all business ceasing every day in the year from 12 to 2, giving everybody a rest and time to go home for their midday meal. Imagine our doing this!

"In Chili I found about the same conditions as in the Argentine, and outside of the countries mentioned there are more people in Jersey City consuming hosiery than the remainder of the South American countinent."

Speaking of the selling end, with particular reference to the domestic trade, Mr. Chipman continued:

"I believe the greatest step that can be taken is closer commercial harmony between producer and distributer, the manufacturer and jobber becoming as a big wheel, the cog of which is unity.

"We cannot overlook the fact of the recent greatly increasing sale of hosiery direct from factory to retailer. No industry is healthy without being profitable, and there are a number of factors contributing to the distribution of hosiery from manufacturer through jobber to retailer, which should be borne in mind:

"First—The enormous growth of magazines and papers carrying each its selling message.

"Second—The great growth of mail and mail orders on the part of catalog houses, department stores and manufacturer to retailer.

"Third—The feeling on the part of retail hosiery buyer that a mill purchase will greatly ingratiate him in the eyes of his employer, which too often is a fact, with the result of his willingness to give preference to that which he believes to be mill purchases.

"Fourth—The depreciation of quality of merchandise which always exists when it is bought to sell on its appearance, rather than on intrinsic merit, to the consumer.

"Fifth—There are some 2,000 hosiery mills scattered almost in every state of the Union, more built each year, and a great many of these distribute merchandise locally to accommodate their retail friends, without the competition of the standard mills."

In the underwear end of the market it is understood that one or two mills have already booked nearly a full production for next season, but these instances are exceptional and as earlier indicated, consist of special types of knit goods. It was reported that two southern mills have made advances of five cents a dozen on ribbed goods. Many knit goods buyers still continue to view the new prices on the higher grades of men's fleeced underwear as out of range with the rest of the market and indicated their belief that eventually the mills would have to make revisions. No indication of this is in evidence at the closing of the month and outside of the army orders in fleeces it is believed that a steady export trade can be looked for through regular channels. The hosiery trade continued to show improve-

ments in spots clear up to the close of the month and it is a firm belief of many that prospects are very much brighter than for some time past.

C. B. Carter, the secretary of the National Association of the hosiery and underwear manufacturers, is looking for larger offices to accommodate the association headquarters at Philadelphia. In this connection it is of interest to note that the annual convention and exhibition of this association will be held in the First Regiment Armory at Broad and Callowhill Streets, Philadelphia, where it has been held during recent years. The date for this convention is May 3rd to 7th, inclusive. This decision was reached at a meeting of the officers of the association at the Manufacturers Club. It is reported that the officers of the association express a better feeling regarding business conditions than for some time past.

COTTON MANUFACTURING.

DESIGNS FOR FANCY COTTON FABRICS.

BY THOMAS WOODHOUSE AND JAMES IRELAND.

PART EIGHTEEN.

Two patterns—a check and a stripe—are phographically reproduced at O and P in Figure 76. The arrangement of the colored yarns are as follows:

Pattern O. Warp: 36 threads white, 6 threads black and white grandrelle twist.

Weft: 44 picks white, 4 picks black and white grandrelle twist 104 threads per inch and 96 picks per inch.

Although the weaves of which this cloth is made are of a simple nature, *i. e.*, the 4/4 basket and the 4/4 twill, yet it requires 48 picks for one complete unit in the way of the weft as shown at Q in Figue 77. This is due to the black and white grandrelle weft interwoven with the warp threads in a twill order. The solid marks represent the black and white grandrelle threads on the surface, while the corresponding type of weft is indicated by the arrow head lines opposite the picks. The combination of the twill with the basket requires a little ingenuity to secure a good result, and even as it is there are floats of 6 in several places. The defect, however, is scarcely noticeable in the cloth. The draft and weaving plans are shown at R and S, respectively.

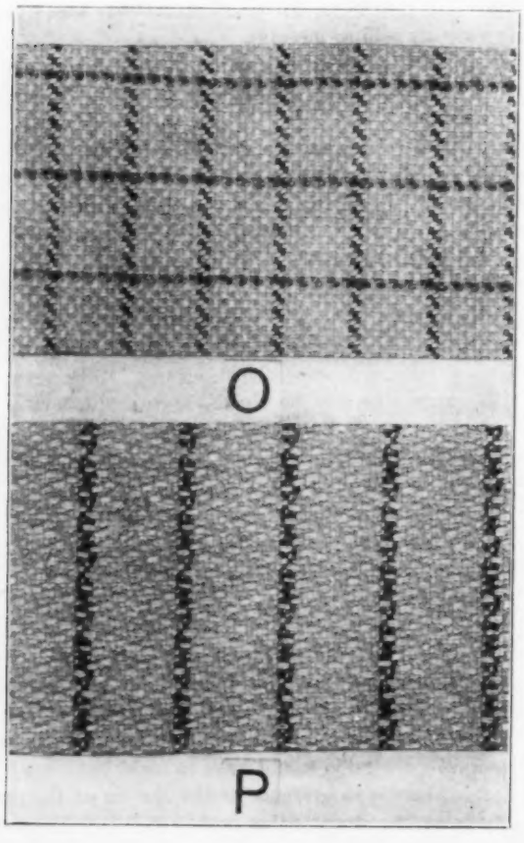


FIG. 76.

The pattern P is a crepe effect improved by a black stripe in the same weave. All the warp, 40 threads of white and 8 threads of black and white grandrelle twist as well as the weft appear double as illustrated in the design T,

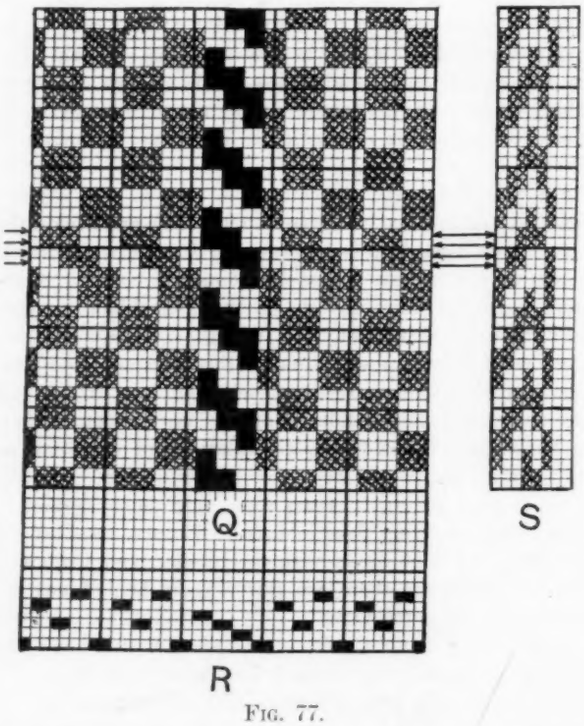


FIG. 77.

Figure 78, and the draft U indicates double draws. In practice each pair of threads which work as one would be drawn through one mail, and hence the draft would really be a straight one on 12 harnesses. Similarly, double weft in the shuttle would be used, and therefore the weaving plan V shows 12 picks instead of 24. Considerable difficulty, however, is experienced in weaving double weft from cops or pirn unless the operatives are fortunate enough to obtain exactly the same length of each yarn in every layer. In some cases a slight twist is imparted to the double filling in order that the two yarns may be wound and unwound

uniformly. It pays to put up with some little inconvenience in this respect because of the extra production which results apart altogether from the difficulties of selvaging in certain cases.

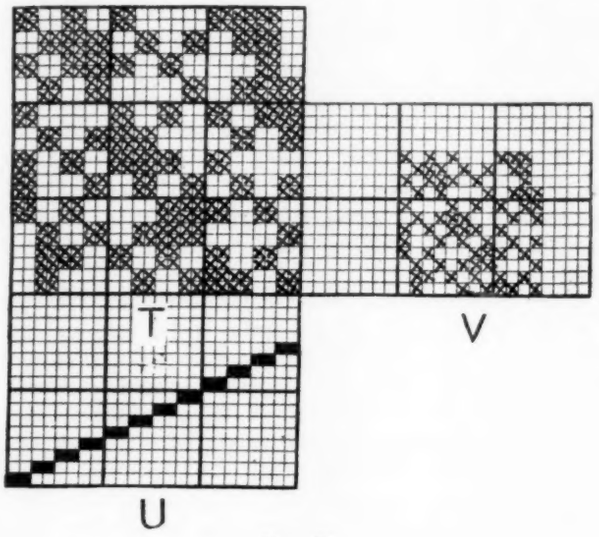


FIG. 78.

The cloth at A, Fig. 79, is woven by another of these simple little crepe-like weaves which give a pleasing effect to the cloth either when used alone or as a ground weave upon which some figure is developed. Both warp and filling of this cloth are 2-ply cream and set almost as closely as it is

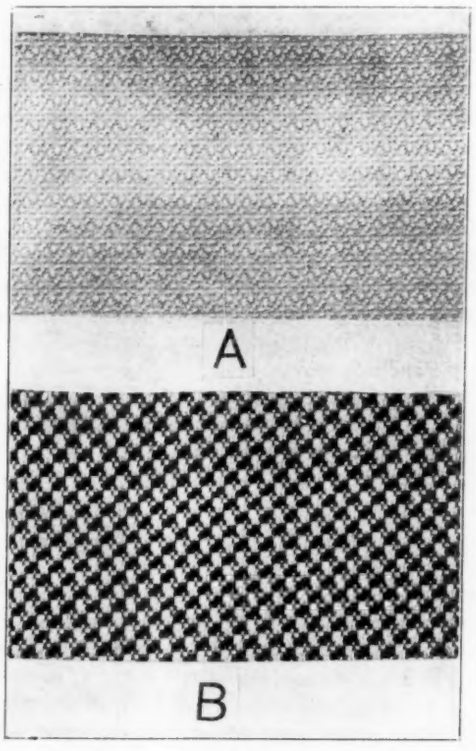


FIG. 79.

possible, thus yielding a very close texture. There are 136 threads per inch and 128 picks per inch. The unit weave is shown at C, Figure 80 and occupies 16 threads and 16 picks. But since it is formed of double threads the draft will be double warp straight over on 8 harnesses instead of

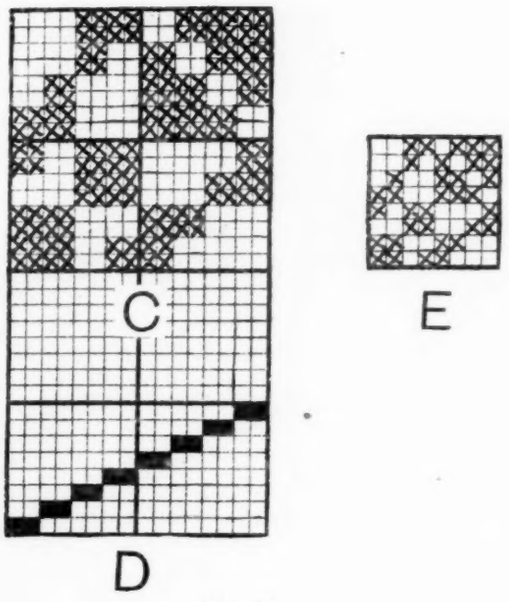


FIG. 80.

as shown in draft D. The weaving plan E is similarly reduced on account of the double picks, and is complete on 8 by 8.

The warp for the cloth illustrated at B, Fgure 79, is all 2-ply white with 112 threads per inch and 56 picks per inch

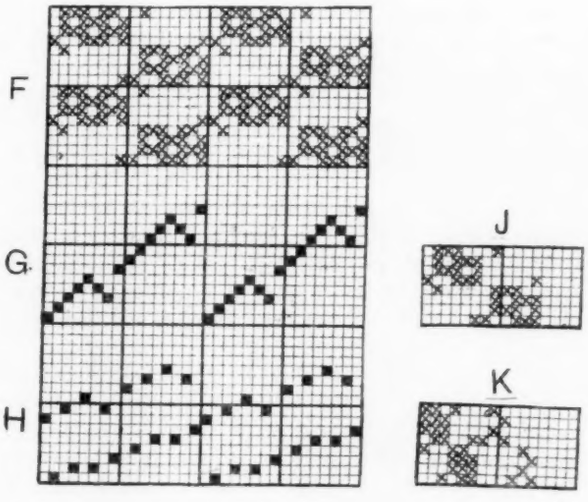


FIG. 81.

of 2-ply maroon filling. The complete weave stands on 16 threads and 8 picks, but four repeats appear at F in Figure 81. Two different drafts G and H are given with their corresponding plans J and K. From the weaver's point of view draft G is the simpler.

(To be continued.)

The Bureau of Foreign and Domestic Commerce is in receipt of a communication from a foreign legation in Washington transmitting a letter from a firm which desires to be put into communication with American manufacturers of cotton fabrics, flannelettes, and oxfords. Samples of the materials desired have been forwarded, and may be inspected at the Bureau of Foreign and Domestic Commerce and the branch offices at New York, Boston and Atlanta. When making inquiry refer to file No. 15135.

THE CARDING PROCESS.

BY H. C. WOOD.

PART THREE.

THE CYLINDER AND FLATS.

Consider the fibres as having been delivered to the cylinder. The speed of the cylinder and the "keen" of the wire is such that the fibre is readily taken up. In considering the action of the cylinder and flats on the fibre it is well to remember that we are dealing with a fibre of about 1/1200 of an inch in diameter or expressed decimally this means .000833 inches in diameter. This fibre, from the time of its formation in the boll, has never felt any well defined restraint upon its natural tendency to curl. The fibre itself contains by actual measurement from 250 to 300 natural turns of twist per inch. I have sometimes heard this characteristic of the fibre spoken of as the "worm" of the fibre.

These two natural characteristics of the cotton fibre make it very difficult to hold the fibre straight after once getting it into this condition. While this tendency to curl, due to the freedom of the fibre, forms one of the evils of the present system of carding, a certain amount of freedom is necessary in order that the carding may be effectively carried on.

The writer has often read and heard of the theory, so called, that each point on the cylinder should take up one fibre at each revolution. Theoretically, it is said that is what should occur and it is generally accepted and credited. But I believe that this theory is at once the most improbable, actually the most impossible of any ever considered in the manufacture of cotton yarns. If such a condition could be brought about I believe there would be no one thing at once so damaging to the fibre and so detrimental to the manufacture of an even, level and clear yarn. But happily this condition is almost impossible of attainment. We can, however, approach such a condition and when we do the card wire becomes over crowded and bad carding results.

Each square foot of surface on the cylinder contains between 55,000 and 90,000 points depending upon the "counts" of wire used. As a result of this large number of points, and the speed of the cylinder, it is impossible to have each point pick up a fibre at each revolution. It is entirely probable that there are certain spots, more or less unevently distributed over the surface of the cylinder, that do not pick up any fibre for perhaps two or three revolutions. This uneven distribution is partly overcome through the action of the flats and the method of depositing the fibre on the doffer. The flats are continually working, picking up, and carding fibre. The slow speed at which they revolve and their action tend to redistribute the fibres picked up from the licker-in, in a more even manner over the entire surface of the cylinder. In the case of a 27 inch doffer making 10 revolutions per minute, with a cylinder speed of 165 revolutions per minute, each foot in length of the web coming from the doffer is composed of fibres that were distributed over a length of 30 feet on the cylinder surface. The condensing of the fibres covering a large cylinder area, onto a small doffer area, tends to partially overcome the more or less uneven distribution of the fibres on the cylinder.

In considering the question of how long a fibre remains on the cylinder before being deposited on the doffer it would be well to remember that some fibres do not stay on the cylinder for even one revolution. There is no doubt that some fibres are picked up by the cylinder, carried through the flats, and then deposited on the doffer, staying on the cylinder but a very short time. As the card continues to run without stripping, the fibres are carried nearer the surface of the wire and are more easily and quickly carried away by the doffer. Again it is well to remember that some fibres become "flocked" in the cylinder and are only removed when the cylinder is stripped. It is possible, therefore, that any condition exists between these two extremes.

Other conditions also influence this important feature of carding. If a heavy sliver is being carded with a short draft and a high doffer speed the fibre quickly passes through the card. These are the usual conditions found where a high production is desired. Where quality is the chief factor, the opposite conditions exist, the stock remains on the cylinder longer and is carded slower.

This brings us to a consideration of the two terms, *fast* and *slow* carding. Fast carding means getting the fibre onto the cylinder and off again as quickly as possible. The maximum of fast carding would be obtained when carding the heaviest sliver at the highest doffer speed, using the lightest lap with the shortest draft. All of these factors would tend to rush the fibres through, allowing the card the minimum time to act upon them. Under these conditions the card really acts as a machine to convert the lap into sliver and to do it as fast as possible.

The opposite conditions exist when slow carding is desired. As to the relative merits of each method, they both have their uses. Where well carded work is desired, slow carding must be used. It is then that the stock is carded and cleaned the most and the most even sliver produced. Where production is the first consideration, fast carding must be resorted to and quality sacrificed. All other things being equal, fast carding is the least injurious to the fibre and will produce stronger yarns than can be made from stock carded slowly. The stock remains on the cylinder a shorter length of time and receives a less harsh treatment, which tends to leave the fibre stronger.

Such a condition exists when carding reworked waste mixtures, consisting of machined roving waste and reclaimed fibre from card strips. Under these conditions the stock has been pretty well worked up. By this time it is well cleaned and more or less weakened. Under such conditions fast carding will prove a benefit, tending to weaken the fibre the least and giving at the same time all the cleaning desired.

In action the flats serve a two fold purpose. With the cylinder they card or comb out the long fibres and at the same time catch and hold the short fibres thrown off by the cylinder. With these short fibres a great many "motes" are found, and while these "strips" are of a low grade in many cases, they are one of the most valuable by-products of the mill.

It is between the flats and cylinder where the most of the carding is done. The diameter of the fibre is so slight that it becomes necessary to make very close settings at this point in order to treat the thin web of cotton covering the cylinder successfully. For this purpose all makers of cards use what has come to be known as the five point flat

setting. This is so called because of the use of a flexible bend adjusted at five points. This flexible bend is placed at each side of the card and upon it the flats rest and ride. In order to maintain this definite relation of flat to cylinder at all stages of wear of the cylinder and flat wire, the bend is flexible and may be sprung into such positions as may be necessary to maintain the proper setting.

Not only do the flats bear a certain relation to the cylinder as regards distance between them but each flat is so constructed that the rear edge of the wire is brought closer to the cylinder than the front edge. This is technically known as the "Heel" of the flat and the opposite edge as the "Toe." This is shown at Fig. 7. The amount of the heel that is usually given a flat of one inch in width is about .02 inches. This means that the toe of the flat

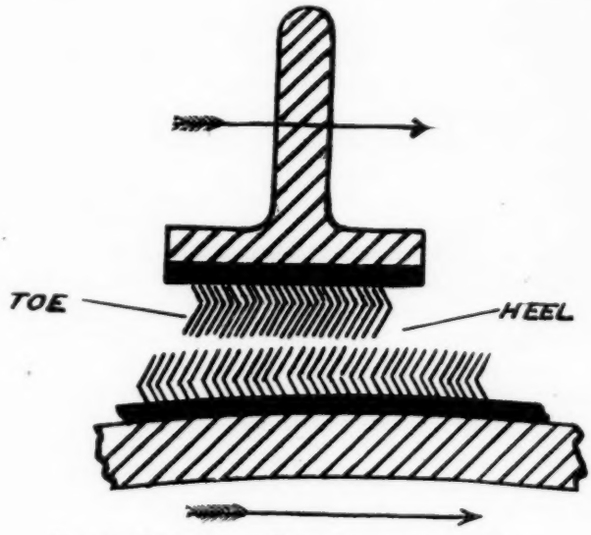


FIG. 7. SECTION OF CARD CYLINDER AND FLAT.

is carried .02 inches higher than the heel. It does not mean that the wire is any shorter at the toe than at the heel, but the construction of the flat is such that when moving over the flexible bend the toe is carried higher.

The reasons for this important construction are as follows: raising the front edge of the flat prevents any tendency of the fibre to catch and roll up at this point; and it allows each fibre a free entrance under the flat gradually subjecting it to the full surface of the flat.

If the flat rode straight and in a radial line drawn from the center of the cylinder through the center of the flat, the nearest point of contact would be at the middle of the flat. This means that for one-half the surface of the flat the fibre would be drawn into the flat and for the other half drawn out. Now tipping the front edge of the flat up throws this nearest point of contact to the rear edge of the flat. Thus the fibre is gradually and more firmly drawn through the full width of the flat, than would be the case if there was no heel. From this it can be readily seen that the setting of the flat to the cylinder really is made at the heel of the flat or the point of nearest contact.

It is considered good practice in setting flats to gradually bring the flats closer to the cylinder as they move forward, making a closer setting at the front than at the back. The reasons for this are as follows: it takes the flat from 30 to 50 minutes to pass over the surface of the cylinder. It enters at the back perfectly clean and as it moves forward it picks up short fibres, motes, etc., and gradually fills up. As this continues and the flat becomes filled, it loses some of its carding efficiency. To partially overcome this loss the flat is set closer to the cylinder as it moves forward.

There is such a thing as overcarding stock and this is

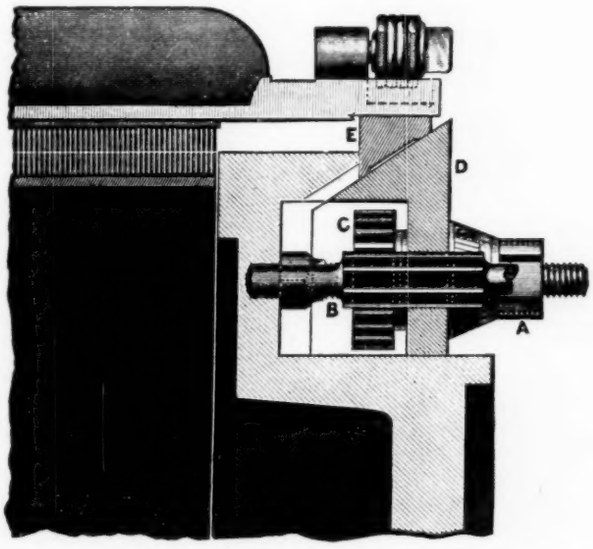


FIG. 8. A SECTION OF ONE STYLE OF FLAT ADJUSTING DEVICE.

more injurious to the fibre than undercarding. When the fibre first enters the flats it is not in a straight condition. As it moves forward through successive flats it gradually straightens out and more easily enters and leaves the wire. Such being the case it is possible to set the front flats closer to the cylinder without injuring the fibre.

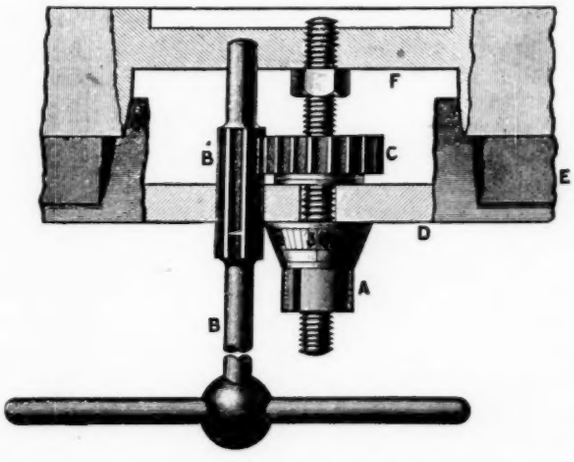


FIG. 9. ANOTHER SECTION OF THIS SAME DEVICE.

There are two types of flexible bends that find favor in the trade. That shown in Figs. 8 and 9 is the device applied to one make of cards, while Fig. 10 illustrates the more common type used by American builders.

There is a certain amount of mechanical ability necessary in satisfactorily making the flat setting, outside of the ability to guage the setting. It is more the mechanics of the setting that will be discussed than the ability to feel the guage as that is something that comes only after long practice and cannot be given in an article of this character.

Referring to Figs. 8 and 9, *E* represents the flexible

bend upon which the flats ride. *D* is a movable bend upon which *E* bears, *E* also bears against the rigid bend *F*. The method of setting the flats is by drawing the movable bend *D* in or out, thereby raising or lowering the flexible bend *E*. As *E* bears against *F*, it is prevented from moving in any direction other than vertical. *E* is fastened to the frame of the card at each end by spiral springs which give and take as *E* is raised or lowered.

The movable bend *D* is held in position by the nuts *A* and *C*. *B* is a fluted key which meshes with the teeth on the nut *C*. By turning *C* or *A* in the required direction *D* is drawn in or out as the case may be, thus raising or lowering the flats. Nut *A* is indexed, each division corresponding to 1/1000 or .001 of an inch, and thus allows the amount of movement of the flats to be read easily. While this adjustment may be reasonably correct, it always pays to be sure, and for this reason adjustments of flats

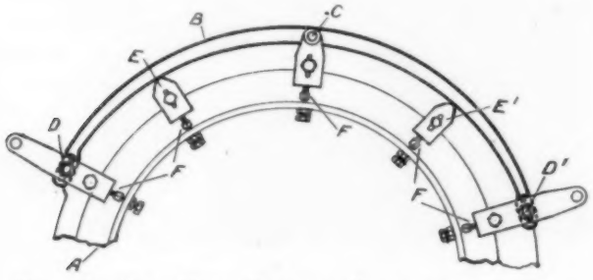


FIG. 10. THE MORE COMMON STYLE OF ADJUSTING DEVICE.

should be made by gage and not entirely dependant upon the index nut.

It sometimes becomes necessary to raise the flats away from the cylinder 1/8 to 3/16 of an inch. The bend *E* is very flexible and can easily be warped to such an extent as to give a false setting. Such a condition is liable to occur when resetting after raising the flats as described. This may be prevented by turning the index nut a certain amount at each setting point in raising the flats and then turn it back the same amount at each setting point before using the gage in resetting. This will bring the flats into as near the previous setting as possible without actually using the gage and will prevent cramping the flexible bend.

Figure 10 illustrates another method, using a flexible bend of slightly different construction. In this method the adjustment is made upon the bend itself. This bend is so constructed that it always has a tendency to spring in. It is made so that it gradually tapers toward the ends, this making it more flexible and more easily sprung. *B* represents the flexible bend and *A* the rigid bend, to the side of which the flexible bend is fastened after being set. *B* is pivoted at *C*. At *E* and *E*' it is supported by blocks. At *D* and *D*' it is bolted to the stands, and any tendency of the bend to cramp is taken care of by the slots in the bend at these points. The bend is so constructed that it has a tendency to spring in towards the cylinder, and movements away from the cylinder cause additional strain on the bend. Adjustments are made by means of adjusting screws *F* at the various setting points, but in this method no index shows the amount the flat has been raised or lowered.

No matter which method is used there is a certain procedure that must be carried out to obtain good results. The setting should be made to the high flat. In every set of flats there is usually one flat that is higher than the others and this flat should be marked in some distinguishing manner. In a newly reclothed set this flat is usually marked with a label to this effect. In setting to this flat one can be reasonably sure that all the flats will clear.

The first adjustment to be made is at the center, after having first lowered the flats into somewhere near the original position, if they had previously been raised. In case the second style bend is used, nuts *D* and *D*' should be loosened. After adjusting the center the points each side of the center should be set, and the ends in succession. Such a procedure forces all tendency to cramp or warp out the ends of the bend and the flats should lay true. In setting flats there should always be the *"rough"* and *"finished"* setting. In the "rough" setting no fine adjustment should be attempted, the aim being to simply bring both sides into as near a level position as possible. It is frequently found that the adjustment of one side will throw the other side out, this should be guarded against by repeated trials with the gage until both sides are alike. In the handling of the gage equal care should be necessary. The closest setting comes at the heel of the flat and any tendency to "pull" the gage will give a false setting.

The percentage of strips removed by the flats depends upon three factors, namely, the setting of the flats to the cylinder, the setting of the percentage plate, and the speed of the flats. Any variation in the amount of strips is usually made by one of the last two factors, and most commonly by readjusting the percentage plate. The action of this plate is rather peculiar. If drawn away from the cylinder it will cause the flats to remove a heavier strip, if set closer to the cylinder it will cause a lighter strip. The reasons for this are that at this point air currents play a very important part in the working of the card. Drawing the percentage plate closer to the cylinder allows more air to enter between the plate and flats. This causes the fibers to hug the cylinder, thereby reducing the amount of strips. Drawing the percentage plate away has the opposite effect. The setting of the flats to the cylinder and the speed of the flats are points usually determined by the class of stock being run and the variations in the strip are brought about by the use of the percentage plate.

Great care must be used in preventing lateral currents of air which cross the surface of the cylinder, for not only do such currents cause a curling of the fibers, but also cause much bad carding together with cut or broken fibers. To prevent this, see that the base of the card is chinked with strips of wood and all air currents excluded at this point. Also see that the stripping door fits tightly.

(To be continued.)

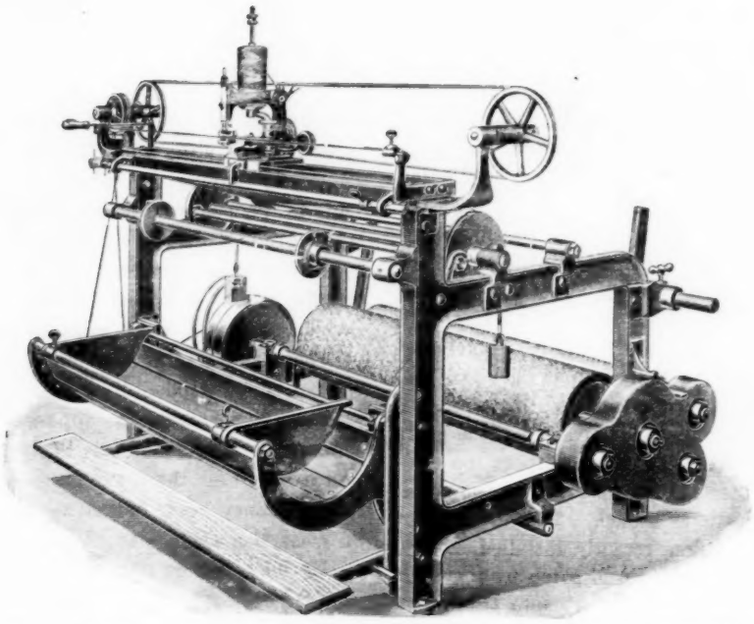
CLOTH ROOM METHODS AND MACHINES.

BY C. T. FALLIN.

Having discussed the various methods that may be used in cloth room accounting I will now take up in their proper order the several processes and machines to be found in an ordinary well managed cloth room.

STITCHING.

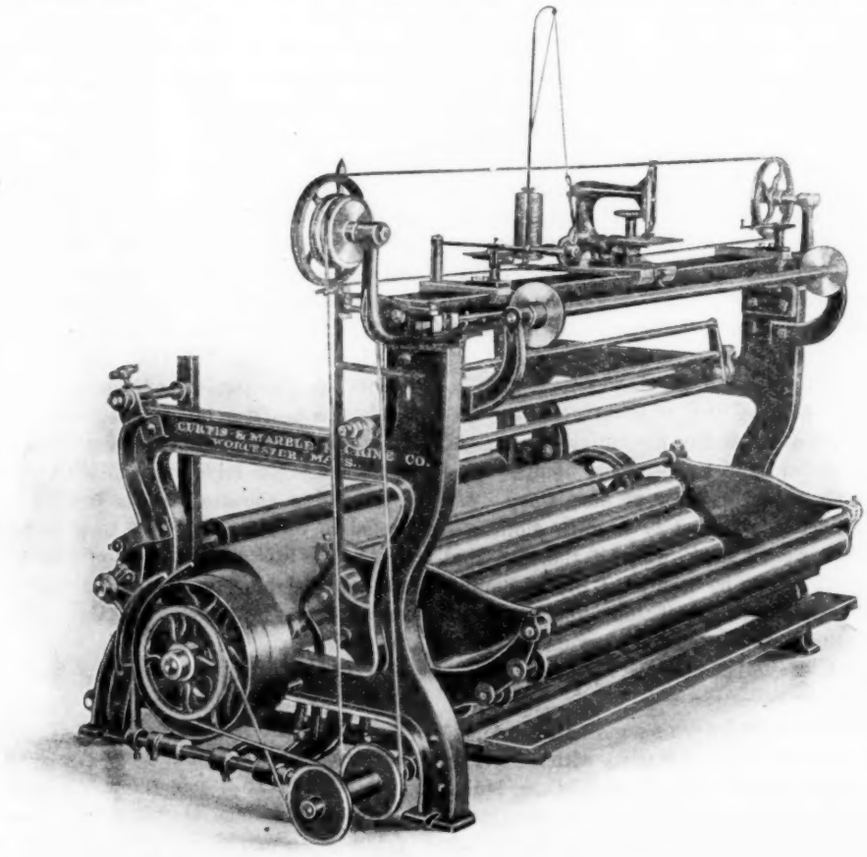
When the goods come from the loom they are in rolls, varying in size from one cut of a certain yardage usually from 40 to 60 yards up to several cuts of a like size, amounting sometimes to several hundred yards in a single roll.



DENSMORE SEWING AND ROLLING MACHINE WITH SINGER TYPE SEWING HEAD.

The first process in the cloth room is to get such rolls into one large roll of usually 2,000 to 3,000 yards. For this purpose some sort of stitching is resorted to, that is the ends are sewed or stitched together as these smaller rolls are unwound and rolled onto the larger one. Many different forms of rolling machines are used, also several types of sewing machine heads. Space will permit giving but a few of these in detail, but all are very similar in design. I present here illustrations of what I have found to be the most common machine in use for this purpose which might be styled a railway sewing and rolling machine.

This type of rolling machine, with very slight modification, may be equipped with other stitching or sewing heads, to suit the desires of the user. The machine is so simple in construction that it hardly warrants description in detail. It has one main driving shaft that through a



CURTIS & MARBLE SEWING AND ROLLING MACHINE.

a train of gears drives two winding rolls, one much larger than the other but both running at the same surface speed. The cloth passes up from the cloth cradle in front; the ends are sewed by being stretched upon the steel rails, after which through a series of gears the stitched head is automatically passed over the ends which are firmly stitched or sewed together; it then passes down through the friction rods where the requisite pull or tension may be adjusted by means of some of the many varied ways of passing goods through these rods; then on down around the larger or back winding roll and is wound on the cloth roll or shell on top of both winding rolls; the gudgens of the cloth roller being held firmly by adjustable guiders or holders.

Repairs and adjustments to the winding part of these machines are but few and are very simple. However, the ways they may be abused are many and varied. The gears on many machines are allowed to run too deep or too shallow. The gear cover is often allowed to grind on the gears. The friction rods are sometimes broken. The majority of the machines I have seen, unless recently installed, needed to have the winding rolls covered. And often by the careless throwing or dropping of cloth rollers into the guides the winding rolls have been so battered as to be almost useless. When it is remembered that these rolls draw or pull the cloth by friction, it is at once evident that battered rolls make less friction. Another very serious abuse and one almost universally practiced is the wetting of the cloth roll before placing it in position, and what is worse it is sometimes wet by pouring water over it after it is in position. This is not only dirty but costly, in that in many cases two to ten yards of goods are spoiled by having the colors bleed, the goods wrinkled, or made so wet they cannot be passed into firsts even after passing through all subsequent processes. Many good overseers may take issue with me when I say that this wetting of the cloth roll is absolutely unnecessary; but it certainly is if the machine has good, smooth winding rolls properly covered, and the cloth is started evenly and smoothly upon the cloth roll. It is well at the start to give the first few yards an excess of tension and then the goods rarely, if ever, slip upon the cloth roller. Some close woven goods, where the machine is run at very high speed, might give some trouble by slipping, but if so, the defect may be very easily overcome by covering the cloth roller with a soft flannel. Slasher flannel is what I generally use.

Before passing from this subject, however, I wish to say something about covering the winding rolls on this machine. Nearly every overseer has his individual idea of roll covering; some prefer sand paper, some flannel, some burlap, and some even argue in favor of bare wood. My preference for any friction roll that is to draw cloth is a good grade of medium weight duck, while if the rolls that are to contain the cloth are to be covered, I prefer flannel.

The care of the stitching head of these machines will be taken up under the head of portable sewing machines of which I shall treat in another chapter.

An agent in Great Britain informs an American consul that he desires to get into communication with American manufacturers of ladies' cotton hose, vests, bodices, ladies' and men's underwear, and various classes of notions. Quotations are desired on deliveries at destination. References are given. Apply file No. 14295. Bureau of Foreign and Domestic Commerce.

SOLVING THE WASTE PROBLEM.

BY "OBSERVER."

Occasionally one finds a spinner or other cotton manufacturer who still clings to the idea that he can save money by buying low-grade cotton. Reference is not made to the concern which is manufacturing a strictly low-grade product, where evenness of the yarn, color of the goods and other qualities are not important; but to the general run of the trade, which is putting out a line of yarns and warps which must be sold for general use.

The manufacturer who notes the differences in prices between strict good ordinary, say, and good middling cotton, and figures what the apparent saving would be in the course of a season's run, is likely to feel a strong temptation to purchase the lower grade and pocket the difference in the money cost, unless he has made an actual study of what the waste amounts to.

He may assume that since the average waste is 15 per cent, according to the general understanding of the trade, this will suffice to cover him, no matter what grade he uses. But if he has actually tested out the proposition, and has found by figuring every element involved what the loss is on a number of grades, he will find himself irresistibly drawn to the conclusion that it is good policy for him to use as good cotton "as the traffic will bear." In other words, he knows that for certain low-grade products like cordage and mop yarns, he could not afford to use a cotton costing above a definitely limited price; but up to that limit, without much question, it is good business for him to invest.

A well-known yarn spinner, who believes in getting at the facts rather than accepting hearsay evidence, had been working along for a number of years using middling cotton. He figured he was getting fair results. He assumed that his waste was about 15 per cent, and the results of occasional checking up, which had to be helped out by approximations in a number of cases, seemed to show that this was correct. The waste, of course, was affected by the seasons, involving the amount of moisture in the cotton; but this particular phase of the proposition equalizes itself in the long run and need not be gone into here.

He finally decided that the only way to satisfy his doubts on the subject of waste, and to determine what grade was best for him to use, was to make an actual test. He accordingly got three bales each of strict good ordinary, strict low middling, middling and good middling, as representing about all of the grades his mill could be expected to consider, and put them through, carefully determining the loss at each stage of the process, and gathering up and weighing the waste in each department. It involved a lot of work, but the spinner believed it was worth it.

When he got through, he found that the percentage of loss ran as follows:

Strict good ordinary, 17.3 per cent.
Strict low middling, 14.2 per cent.
Middling, 13.2 per cent.
Good middling, 11 per cent.

In other words, there was a difference of 6.3 per cent in the waste on good middling and strict good ordinary. Of course, this comparison in itself is not sufficient to

demonstrate the proposition, inasmuch as the difference of 2.65 in the value of the cotton is greater than the percentage noted. But this is but one of many factors, and a consideration of the whole situation led to the decision to use good middling thereafter, instead of lower grades.

Everybody understands that the man who is working a low-grade of cotton through his machines is wearing out the equipment a good deal more rapidly. The dirt dulls the equipment, clogs up the lines and interferes generally with the handling of the material, making it necessary to overhaul the spinning equipment a good deal more frequently and shortening the life of the machines by a considerable margin. This is a factor which should not be disregarded.

It may be worth while to give the test referred to in detail to show just how the waste was distributed in the various grades. The following table will indicate the situation exactly:

TEST FOR LOSS IN SPINNING.

	Strict Good Ordinary		Strict Low Middling		Middling		Good Middling	
Gross wt.	1,345		1,512		1,560		1,500	
Bag.	50 lbs.	3.7 %	42 lbs.	2.9 %	50 lbs.	3.2 %	50 lbs.	3.3 %
Ties	28 lbs.	2.07%	28 lbs.	1.85%	26 lbs.	1.66%	25 lbs.	1.66%
Pick.	93 lbs.	6.91%	73 lbs.	4.82%	70 lbs.	4.48%	33 lbs.	2.2 %
Dirt	26 lbs.	1.93%	21 lbs.	1.39%	14 lbs.	.90%		
Strip.	23 lbs.	1.7 %	34 lbs.	2.24%	31 lbs.	2. %	41 lbs.	2.7 %
Swps.	13 lbs.	1 %	15 lbs.	1 %	16 lbs.	1 %	15 lbs.	1 %
N. wt.	1117		1299		1353		1336	
L. %		17.3 %		14.2 %		13.2%		11 %

The most noteworthy feature of the comparison, of course, is in connection with the picker and dirt proportions. Here are the points at which the grade really makes itself felt to the greatest degree, since bagging and ties are a constant factor, and some of the other items are more or less affected by the kind of work that is being done. On the other hand, loss in the picker and loss through dirt indicate exactly the result of the difference in the grade. In the case under discussion, the loss through these two items alone in strict good ordinary cotton was 119 pounds, or 8.84 per cent, compared with 33 pounds, or 2.2 per cent in good middling. That these are the really vital factors is shown also by the fact that the difference here, 6.64 per cent, is just about what it is for the total, with all loss factors taken into account.

Tests of the kind noted should be taken occasionally, at least, in every mill. There are cotton manufacturers who "assume" that their waste is 15 per cent or some other arbitrary amount, without ever satisfying themselves through an actual test, by which the matter may be determined. It is plain, of course, that using three bales of each grade does not furnish a broad enough basis for an absolute comparison; but it at least gives a pretty good idea of the way the proposition is running, and enables the manufacturer to draw his conclusions with facts instead of assumptions at hand.

The man who uses a large percentage of low grade cotton and consequently has a large amount of waste to work over not only cuts down the amount of merchantable yarn which his mill is capable of producing, but likewise supplies himself with a problem of no mean proportions in marketing the waste product. Mop yarns, low-grade lamp wicks, insulation, etc., etc., are called on to furnish an outlet for this material, but it is always a hard job to get a satisfactory business for the waste, in the respect of taking the volume and furnishing a fair price. And the spread between the price of this low-grade material and good yarn is so much greater than the difference between the cost of good cotton and low-grade that the comparison is at least suggestive.

The considerations which apply to the spinner of yarn are also to be given thought in the knitting mill as well as elsewhere. The knitter who purchases yarn as cheaply as possible is insuring a big percentage of waste; he is making certain a product which is going to be sold on price rather than on quality; and he is helping to increase the depreciation of his machinery, and to hasten the day when the equipment must be thrown out and new purchased. In other words, he is allowing the prospect of saving on his raw material to outweigh the more important consideration of how the material works up, how waste is involved, and how good the resultant finished product is.

Instead of trying to use material, whether cotton or yarn, that is as poor as possible, much might be gained by taking the other horn of the dilemma and using material that is as good as possible, the character of work and the available markets considered. Using a system of this kind is sufficiently unusual to attract attention; and the concern which works on that basis is always sure of having a good many talking-points in the way of quality which are not shared by the house which has cut the cost at the most important point—in the material. In view of the fact that low-grade cotton has been in greater supply than usual for the past season, with a consequent depression of the price, some buyers may have assumed that the use of poorer material than they are accustomed to purchase would be good business; but close study of the factors involved, including waste, depreciation of equipment and the marketing of low-grade by-products, should tend toward a change of policy in this important feature.

An estimate of the cotton grown in new fields in the British Empire during the last three years follows, the figures representing bales of 400 pounds:

	1911	1912	1913
West Africa:	Bales.	Bales.	Bales.
Gold Coast	100	120	100
Lagos	5,800	8,900	14,000
Southern Nigeria	300	270	200
Northern Nigeria	600	2,600	2,000
Total	6,800	11,890	16,300
East Africa:			
Uganda	20,000	29,000	26,000
British East Africa	500	900	1,000
Nyasaland and Rhodesia	5,300	7,200	7,500
Total	25,800	37,100	34,500
Sudan	21,000	15,000	20,000
West Indies	6,500	6,500	7,000
Other	700	1,000	1,000
Grand total	60,800	71,490	78,800

A pharmacist abroad asks to be put in touch with American manufacturers of absorbent cotton. The consul states that hitherto this article has been purchased in Europe. Further information may be secured from the Bureau of Foreign and Domestic Commerce or its branches. Refer to file No. 14486.

KNITTING DEPARTMENT.

THE MANUFACTURE AND FINISHING OF HOSIERY.

BY "KIM."

PART ONE.

In writing a series of articles for publication in COTTON on the manufacture and finishing of hosiery, I shall endeavor to use only terms and language that any knitter may readily comprehend. This first article of the series is on the manufacture of infants' cashmere silk tip heel and toe goods. This line is manufactured in the United States only in a limited way and very few manufacturers are conversant with the possibilities in such goods and of the small investment in machinery necessary to obtain a large production as compared with other lines.

Commencing with the manufacture, yarn must be first considered. In giving the number of yarn I base my figures on a standard cut of rib and footing machines.

Let us take Bradford spun 2-ply 39's. 2-ply 40's would be the proper number to give, but owing to the fact that this yarn very often spins light, we will use 2-ply 39's to be on the safe side. Yarn should be purchased from the spinner in skeins, sent to the dyer and dyed in the skein in such colors as black, red, pink, sky blue, tan and bleached white, using the best quality of dyes and chemicals.

To make the best grade of goods yarn should be spun of pure Australian wool stock, and the cost for bleach white will exceed the colors in price by about 2½ per cent. This stock must be entirely free from all dark, stained, or discolored wool and unless all of these defects are cared for in the sorting of the wool, they will appear in the knit goods, thus making second quality goods. For the other colors these imperfections are not of such importance.

Yarn is delivered to the mill by the dyer in the colors desired, in a dry condition and ready for the winder. The winding machine must be equipped with an attachment for winding skein yarn and there are several makes of machines suitable for this purpose. Great care must be used in the winding of the yarn and nothing but a weaver's knot should be tied. The scrapers should be set to allow the yarn to just pass through as if the scrapers are too far apart, bunches of yarn, loose ends and dirt will wind on the bobbins, causing the rib or footing machine to press off, cut holes, or smash up. The smaller the knot tied the better, as large knots will cut more quickly in knitting. If possible, it is well to allow the yarn to remain on the bobbins one or two days before knitting, but this is very often out of the question. The reason for this is, that if the atmosphere in the room is damp and heavy, the yarn absorbing this moisture will increase about three per cent in weight which is often times a benefit in knitting, especially if the yarn has been burned or hardened in dyeing.

Attention must be paid to the operator on the machine, as some operators, through carelessness and neglect, will make so much waste that they become a detriment to the mill owner. One operator on the yarn mentioned should wind 80 pounds in ten hours and not produce over one per cent waste. Fig. 1 shows a good system card for the winding room. The foreman supplies each winder on the day starting the mill week with a card. Each day he properly fills in this card according to what has been done by the operator, and he also keeps a record for his own use. He weighs the amount of yarn given each operator and the waste taken from each operator each day. When the week is completed the foreman collects these cards makes a total of each column in the cards, seeing they balance properly with his own record, and gives each operator a report of the total for the week. Some operators will produce more work than others in a week on the same number of spindles. When the foreman has his reports all totaled, he can see at a glance the swiftest operator, also the slowest. The object is to get the slow operator to produce the same amount on the same number of spindles as the swift operator. In some mills the operator is paid by the number of pounds wound, at a fixed price per pound, while other mills pay by the day. A good plan is to locate the best operator and get this operator up to the highest point of production possible. Then use this operator as an example for the others, and the foreman should use all his efforts to get the slower help to produce the same amount of work in the same time on the same number of spindles. The finer the yarn the less the number of pounds the operator can produce.

OPERATOR	DATE	No HOURS	No SPINDLES	No YARN	COLOR	POUNDS WOUND	OZ WASTE	REPAIRS	PRICE PR HR OR POUND	REMARKS
L Smith	1/6									
	1/7									
	1/8									
	1/9									
	1/10									
	1/11									
TOTAL										

FIG. 1. A WINDING ROOM RECORD.

The yarn is now on bobbins ready for the knitting of the rib legs. The legs are knit on a circular latch needle knitting machine. Two sets of needles, one horizontal set and one vertical or parallel set. The cylinder needles being vertical, the dial needles being horizontal. To begin with, these machines must be perfectly clean and free from all oil and grease. It is frequently necessary to take these machines apart, wash the needle cylinder, dial cam, cylinder take up, dial needles and cylinder needles in gasoline. Wipe all parts thoroughly dry, put the take up together, and replace in position on the machine, replace the cylinder which is fastened with screws from the bottom. The cam cylinder is composed of two parts, one part contains the cam for pulling down the cylinder needles, while the cam for raising the cylinder needles to the proper level is placed on the revolving ring. Place the section of the cam cylinder containing the pull down cam for the cylinder

needles its position on the machine and tighten the screws thoroughly. Take a small piece of waste and apply a small portion of pure vaseline, wipe around the cylinder, put up the last section of the cam cylinder and tighten the screws securely.

Now the machine is ready for the dial to be placed in position. First the dial must run perfectly true on the spindle; second the dog on the bottom of the dial must be set in such a position as to allow the dial needles to come out perfectly in the center of the space between the cylinder needles. This adjustment is secured by loosening the screw in the dial dog. Get the dial dog securely against the dog on the cylinder, then the dial can be moved to the exact position. Lift the dial cap carefully from the machine and tighten the screw in the dial dog. The dial will then be in perfect position.

Remove the collar on the bottom of the spindle, take the dial from the spindle and wipe over the face of the dial with a rag containing vaseline, replace the dial and tighten the collar. The dial contains no needles. Place the cap on the machine, tighten the nuts on the dial posts, and start the work on the cylinder needles only. Run down with a cheap grade of cotton yarn a few inches. Get the dial dog against the dog on the cylinder, replace the dial needles, every other needle all around, and run a few inches of work. Then replace the balance of the dial needles and again run a few inches of work. If this work is clean, the machine is now ready for the worsted yarn.

In knitting worsted yarn, great care must be used to get the work soft and elastic. Hard, harsh worsted legged stockings will find very little sale. Considerable of the harshness in feeling can be overcome by adjustment on the machine. Have the dial running low, just so the work on the machine, when the welt is being made, will pass through freely; draw a long stitch on the cylinder needles and have the dial needle cam set to cast off on a short stitch. If the stitch is too short on the dial, tuck stitches will show on the work. If this fault occurs, press the dial needle cam in a trifle harder. Regarding the adjustment of the yarn carrier, I have never found any given way to properly adjust it. A carrier set on one machine will work satisfactorily, while another machine with the carrier set in the same position, will produce bad work. On new machines yarn carriers can be set in nearly the same position, while on machines that have been in operation for a time there will be a difference in the cams and the only way is, to set the carrier where it will produce perfect work.

In making the leg of the stocking we will describe it as being three distinct parts, slack course, fabric and welt. At the beginning of the leg is the welt, which is made in the following manner: first take the pattern wheel on the side of the rib machine, and which contains screws for its entire circumference, on which the bottom of the dise post rides; with the bottom of the dise post resting on level screws, the machine will make plain work only. The pattern wheel has three sets of holes for the screws so any number of welts desired can be made. The distance between the welt and the slack course, which is the total length of the leg, is controlled by the take-up pulling down the work as fast as it comes from the needles. The work is also pressing lightly against the wire brush wheel which controls the chain. This chain contains one high link which trips the lever, throws it down and allows the racking pawl to drop lower and catch in the tooth which before has been a blank. This starts the pattern wheel in action.

After making a few courses on the level screws, one screw is removed, which allows the dise post to drop lower and connect with the throwing-in slack course lever which draws down the cylinder needles farther, and raises the dial needles higher and thus makes a longer stitch for one revolution of the machine, as one rack to every revolution of the racking pawl brings the dise post again on the level screws. This slack course is necessary and will be explained when we get to the handling of the legs on the footing machine. After the slack course, the machine makes sixteen revolutions and the welt is started in the following manner. The dise post is now riding on the level screws making plain work. Raise one screw the height of one hole. This causes the dise post to raise high enough to connect with the throwing-in welt lever and to throw the dial cam far enough in to prevent the stitch from clearing on the dial needle; the machine makes one revolution in this position. The next screw following in the pattern wheel raises to the highest hole and this allows the dise post to raise higher and connect with the longest part of the throwing-in welt lever, which throws the dial needles in and entirely out of action for one revolution of

KNITTER	DATE	HOURS	Nos INCH	DOZ	SIZE	STYLE	SECONDS	PIECES TO B W	DIAL NEEDLES	CYLINDER NEEDLES	RATE PER HR OR DOZ	REMARKS
TOTAL												

FIG. 2. A FORM FOR THE RIB KNITTERS.

machine; it then falls back to the level again for two revolutions and repeats the same operation for as many welts as desired. The distance between the welt and slack course is concluded by the number of links in the chain, the more links added the longer the leg will be.

This line of infants' hosiery is made from sizes 4 to 6½. The following size and cut of rib machine has been used successfully in this work:

For sizes 4 and 4½, diameter of machine 3¼ inches and the number of cuts in the dial and cylinder 80 by 80.

For sizes 5 and 5½, diameter of machine 3½ inches and the number of cuts in the dial and cylinder 86 by 86.

For sizes 6 and 6½, diameter of machine 3¾ inches and the number of cuts in the dial and cylinder 92 by 92.

While there is really no standard cut, those given are a good convenient size and cut for this number of yarn and class of goods.

For length, it is well to make the legs run full for size, starting size four at nine inches long and make each half size one inch longer as follows:

4—9, 4½—10, 5—11, 5½—12, 6—13, 6½—14.

The legs should be made one and one-half inches longer when they come from the take-up than the length required when finished. It is well to have the machines numbered,

have one dozen cut from each machine, the number placed on the ticket corresponding with the machine and then allowed to stand over night; then these should be weighed and measured on the following morning. This will give the correct weight and length which is a large factor in the cost. Fig. 2 shows a good form to use on the rib knitters.

The best method is to have each operator run a given number of machines, about ten. Have all operators cut, inspect, tie in dozens and ticket their own work. Machines should produce on an average of 12 dozen per day of ten dours. Foreman should fill out the report card daily and handle at the end of the week just the same as the card in the winding room. It may be well to state that some machine builders measure from back to back of opposite needles while others measure from face to face of opposite cams in determining the size of machines. The dimensions given here are from cam to cam. On this class of work great care must be taken to keep the work clean from spots, and grease, and when using vaseline do not use oil, as working together they will produce a thick black grease which ruins every piece of work it touches. The legs are now ready for the footers, and the footing and finishing process will follow in the next article.

THE MANUFACTURE OF FASHIONED KNIT GOODS.

BY WILLIAM DAVIS, M. A.

PART ONE.

The making of knitted goods differs in many ways from the production of woven cloth and in many respects the hosiery manufacturer has more difficult problems to tackle than the maker of woven fabrics. One out-standing difference in their respective problems is that the manufacturer of knitted articles requires not only to produce the material fabric right in designs and coloring, but he also has to form it into the multifarious shapes and sizes which are necessary to make the garments to fit the human form. In most cases, the weaver of the cloth does not also make-up the clothing, although an important exception is to be found in the shirting and blouse trade where it not infrequently happens that the complete operations of weaving and making up are performed on the same premises.

In producing garments, the hosiery manufacturer has several methods at his disposal. He may, like the tailor or costumer, receive the finished web and cut out the different portions with the scissors and afterwards join them together to form the complete garment. The articles may be worked in shaped portions in a machine and accurately fashioned so as to join together with perfect edges and make a resultant garment of uniform thickness, or he may have the articles made complete on certain machines which are so constructed in their mechanism that no joints are necessary, the articles being produced in circular form and shape to fit the body and limbs. To consider the case of goods which are taken from the web of fabric by cutting out with the knife or scissors, the operation is analogous to the tailors art except that the articles are cut in layers and many goods of the same class can be made at the same time. To produce knitted styles in this way suits the requirements of a huge section of the trade where limited price and tremendous production are the chief points of importance, but for knitted goods "de luxe" and for the more specialized varieties demanded by the fastidious wearer, there can be no doubt that the fully fashioned or shaped method of producing hosiery and knitted clothing is to be preferred.

In factories where such fashioned goods are made it frequently happens that their manufacture and the method of drawing out the shaping of the goods is in the hands of a very few overseers who often look on the principles of fashioning as a trade secret to be guarded with the utmost vigilance. The principles of fashioning are capable of being understood by anyone of average ability and all that is really required is a knowledge of the method of gaging hosiery machinery and fabrics.

The general run of hosiery machinery is adapted for the making of fabric of a given width, which width is maintained uniformly unless means are taken and apparatus introduced for increasing or decreasing it. Machines having the necessary fashioning apparatus are usually of such design that the tackle can be brought into use or put out of work as required, so that if uniform fabric is asked for, it can be made readily and if fashioned goods are

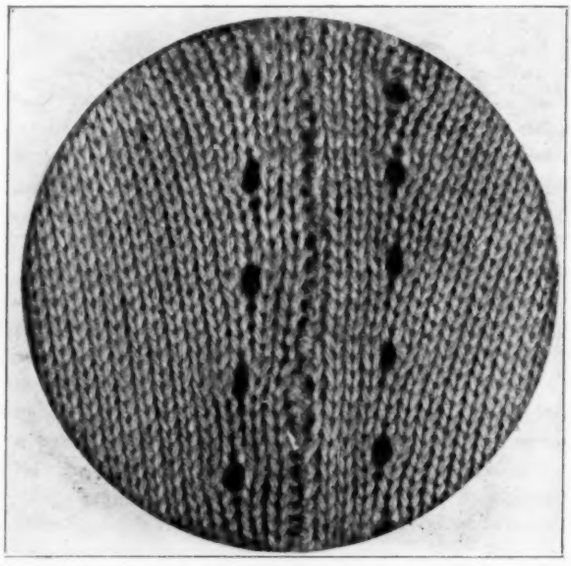


FIG. 1. WIDENING ONE NEEDLE AT ONCE, NOT COVERED.

required, the apparatus can be at once set at work to produce them. For obvious reasons the flat machines adapt themselves more readily to fashioning or shaping than the circular variety, in fact it is only the flat machine which can make fashioned goods without restriction as to the amount and variety of the fashioning courses. Fashioning on circular frames is often restricted to certain stitches and conditions of structure, but on the flat rotary frame, fashioning can be performed with the utmost nicety to satisfy the most exacting conditions of structure, size and shape.

PRINCIPLES OF FASHIONING.

The method of fashioning consists in increasing the width of the fabric or decreasing it, an increase of the width representing a widening of the fabric and a decrease representing a narrowing of the fabric, those changes taking place at the edge of the cloth. If the width has to be increased, then the edge stitches are transferred farther out so as to cover a needle more of the width. Now in removing these stitches, it would appear at first thought that it would only be necessary to remove the end stitch,

but this proved by no-means satisfactory on account of the ragged edge which is the result. When the stitch is being transferred farther out, it follows that there is a certain amount of stretch to the yarn and the edge loop becomes much larger in size, and when this takes place all along the edge of the cloth a very uneven selvedge is produced, those large extended stitches being very much in evidence and giving to the whole garment an untidy appearance. To avoid this, it is found desirable to remove a series of stitches at the edge so that the change will take place several stitches farther in from the edge and the fabric will present there the normal appearance, not even impairing the strength.

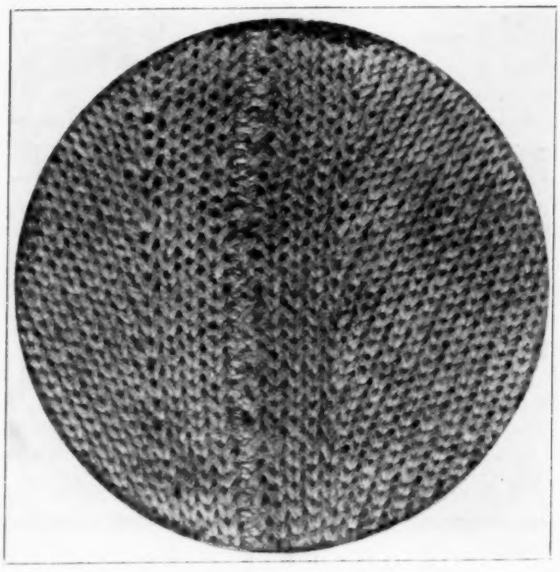


FIG. 2. WIDENING ONE NEEDLE AT ONCE, STITCH COVERED.

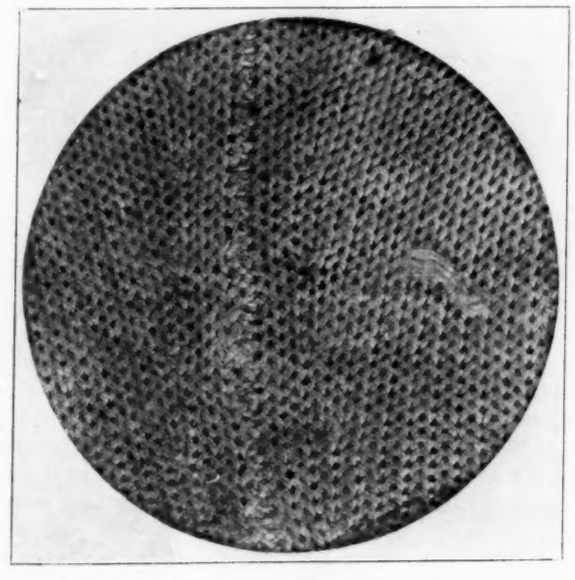


FIG. 3. NARROWING ONE NEEDLE AT ONCE.

As is well known, when a stitch is removed onto a neighboring needle, the effect in the cloth depends entirely on whether the needle is being left empty of a stitch or whether an extra stitch is placed onto it. In widening, the needle must be emptied of its stitch, so that unless some precautions are taken a considerable opening will be shown when the working of the fabric is proceeded with, and these openings are quite in their place when lace goods are sought after, but in the normal plain fabric, the effect has no significance as a designing feature and requires to be filled up somewhat so as to improve the appearance. Especially when those stitches occur with considerable regularity all along the edge of the cloth, every few courses or so, the widenings constitute a defect in the garment. Fig. 1 shows the effect in the cloth when the entire stitch is removed in fashioning to widen the fabric and in Fig. 2 is given the stitch as it has been improved in the latest types of machines for doing this work.

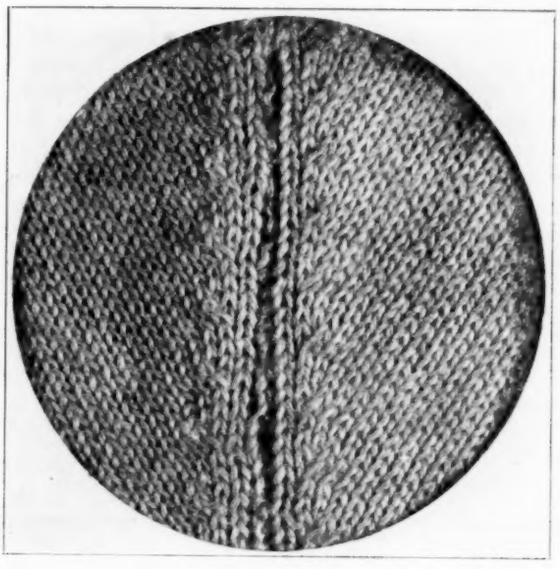


FIG. 4. NARROWING TWO NEEDLES AT ONCE.

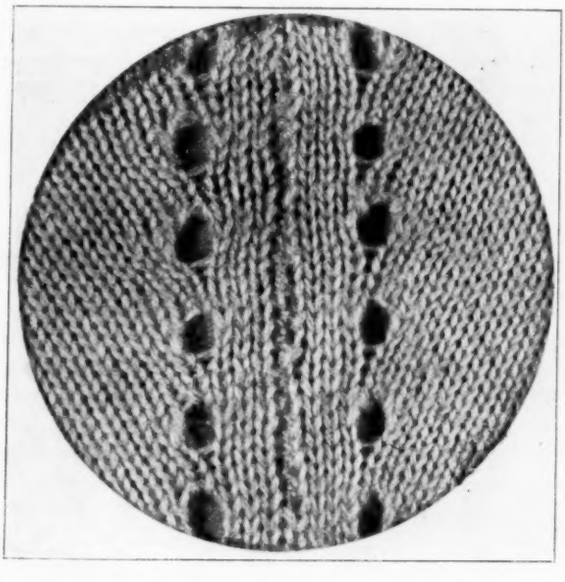


FIG. 5. WIDENING TWO NEEDLES AT ONCE.

In removing the stitch entirely from the needle, then the support of the stitches found on either side of it is removed and an opening is formed which is equal at least to twice the dimensions of the original stitch and it takes a course or so of fresh loops to restore the fabric to its normal appear-

ance. By the improved fashioning stitch a point is brought down which spreads the stitch which has been transferred over two needles, half of the stitch being on its own needle and its other half being on the neighboring needle. The extra width is in this way obtained and the thread stretches to some extent over the opening formed, thus doing much to fill it up and take away the hollow appearance.

The same difficulty does not occur when the machine is narrowing and decreasing its width a needle at a time. The edge stitches are worked on as before, the end four for example being transferred from their needles and shifted one needle space farther in. Thus it happens that about the third needle from the end, two stitches are found superimposed one on the other, forming, it is true, a slightly raised effect in the cloth but being only noticeable on close examination and constituting no real imperfection in the cloth. Fig. 3 illustrates narrowing one stitch at once and Fig. 4, two stitches at once, the latter being more common in practice.

Variation in the width of the fabric for the purpose of forming the article under consideration is usually a somewhat slow process and whilst it is taking place, the ordinary knitting activities of the frame are suspended, so that much loss of time is the result, as it may happen, the fashioning has to take place every four courses, it means that the time of a course at least is taken up in the transferring operation and the production of the frame is retarded by about 25 per cent. This being the case it will be evidently an advantage to have the fashioning accelerated as much as possible and one device is to narrow two needles at a time as at Fig. 4, so that narrowing can occur only half the normal time. Two stitches are in this way superimposed on two others and the resulting elevation in the fabric is not such as will constitute an imperfection except in the coarser gages of cloth. There is a slight disadvantage in the respect that the fashioning is not so accurately performed, the shape being less delicately defined and the form of the garment resulting is not so perfect. The same method cannot be adopted in the case of widenings for the reasons already enumerated, that is the needles would be stripped two at a time and the resulting opening in the cloth would be very large in proportion, so much so as to cause an undoubted imperfection of grave nature in the fabric. It is usually found, therefore, that widening can only be performed one needle at once, the opening being covered up in the way indicated. Fig. 5 shows the great defect which would appear if the cloth were widened two needles at once without covering points being used.

Dyeing, Bleaching and Finishing.

ECONOMY IN DYEING.

In discussing the application of economy in dyeing, it may be pointed out that only a limited number of special examples can be cited. Bad economy frequently results from apparently trivial causes, like an ill-fitting plug in a dye-vessel, and the wastage may be enormous in the aggregate. The type of economy effected by repairs of this kind can hardly be dealt with here, however, the object being rather to indicate the modern demands on the dyer and how they can be met; also the trend of progress in dyeing so far as it demands economy.

General economy in a dyehouse may be divided into: (1) economy in dyes and drugs; (2) economy in steam and labor; (3) economy in time; and (4) utilization of waste or by-products.

1. Buying of both dyes and drugs offers great opportunities for saving. It is impossible to praise too highly a regular system of testing what is brought to see if it is up to standard. It is possible only in this way to know actually what one is buying in the case of chemicals and dyes. Also, for economy's sake, it is desirable to exercise every care in the use of dyes and chemicals. So far as matching is concerned one need say little, as no definite rules can be laid down as to the cheapest way of getting any desired shade of any particular fastness. The use of bottoming colors has been well attended to, and few dyers would set about getting a deep mode shade with nothing but pure primary colors. On the other hand, it is necessary that the number of secondary and tertiary colors in stock should be kept as low as possible. Cases could be cited where sixty or seventy different dyes were in stock for regular dyeing of mode shades on one class of goods only, when a dozen or so well-chosen dyes would have done the work. Such an excessive stock means bad stock, bad economy, and often worse results in dyeing. It should be remembered that while some of the best matchers use the most complicated mixtures of dyes for getting their shades, they rely mainly on two or three of the dyes for the body of the shade, the others being used to touch it off this way or that for a perfect shading up. It needs an expert to control a large number of dyes like this. It should be remembered that every primary color is under direct control, but secondary colors are not.

In using an orange dye one cannot avoid using, as it were, two colors at once—red and yellow, in an indefinite mixture. What opinion would be formed of a dyer who deliberately mixed up a stock of yellow and red dyes in unknown amounts for the use as an orange, which orange dye he then used instead of red and yellow separately as each might be needed, often dyeing along with five or six other dyes, some of them similar mixtures? Yet this is a fair example of what an unlimited use of secondary and tertiary dyes means, and many of the so-called new brands of the color firms are simply special mixtures of old dyes to meet the demand for any and every shade. While it pays the color makers to do this, it does not pay the dyer to use these mixtures in most cases, for he might as well mix the dyes in the bath and know what he is using as work in the dark with such dyes. The demand for concentrated brands is being met, and that is a healthy sign. It is obviously uneconomical to have to pay for a dye-powder being diluted to about half its real strength in order to pay a cheap price per pound.

By securing the best possible exhaustion of baths before running off, economy is satisfied. The use of the newer assistants, such as lactic acid bodies in chroming, has been largely fostered by the desire for saving chrome. Perhaps in the past chrome has been wasted as much as any other dyer's drug. Standing bichrome baths give up only half

their chrome to wool, and an addition of sulphuric acid is necessary to revive baths which have become greenish—*i.e.,* overcharged with potassium chromate which will not mordant wool. Space does not allow of the discussion of many examples, but the following illustrate the value of chemical knowledge in getting economical results with various baths (*a*) In using tartaremetic baths for fixing tannin mordants, the fixing bath becomes gradually acid as antimony is taken up. This acidity will hinder the further exhaustion of the bath unless neutralized from time to time—*e.g.,* with a little soda. (*b*) The successful use of the newer bleaching agents, of malt extracts, etc., is largely a matter of economy through proper chemical control.

All peroixde baths and per-bleaching baths generally should be made slightly acid when not in use, and excessive wastage prevented. It has been claimed that electrolytic bleach has not so good keeping properties as hypochlorite of soda made up from bleaching powder and soda crystals. Electrolytic bleach can be made to have the same keeping properties by adding sodium carbonate to it, if necessary.

These are cases where a little adjustment makes all the difference in economy.

2. Economy in steam introduces factors such as the quality of water used for boiler purposes, of fuel, etc., with which one cannot deal now. As indicating the attention recently given to economy in this direction, the automatic mixing valve for steam and water might be mentioned.

In the planning of a dyehouse opportunity is given to make permanent economies in future working. One suggestion for a piece dyehouse is that wherever possible two methods of driving should be available, the most economical being from the main mill shafting, but the second drive from a small engine, allowing one to continue dyeing after the main shaft has stopped, this alternative presenting considerable advantage.

The modern tendency to use shorter baths results in a saving of steam. The value of certain patent dyeing machines is greatly increased by the saving in steam effected. Bound up with this matter is economy in labor and time. All shortening of dyeing processes results in a saving of steam and labor. The greatest of all economies is usually economy in time. A shorter dyeing period or more convenient handling of goods means increased output with the same plant and pay roll and practically the same steam and power cost.

Wherever possible such changes represent the greatest economy. The fibres also are left in the better condition when the dyeing treatment is not so lengthy. Dyeing, however, is a time-operation, and to get good results the time factor must have due consideration. In the realm of mordant dyeing, however, time economy has been rendered possible with little depreciation in value of the shades produced by the introduction of single-bath chrome dyes, dyed with the mordant added at the beginning. They may not meet every possible case, but the majority of shades of good fastness which used to be obtainable by only two baths may now be dyed in one only, with half the total time of treatment previously demanded.

There is at present a tendency to dye more and more with material in a compact form, the dyeing of slubbing in top, of cops and cheeses, saving making into hanks and re-winding. There are even attempts to size cotton in the warp bobbin form, and these have met with partial success, at any rate, as may also be said of bleaching in the bobbin form and on the beam. This style of treatment is demanded of the dyer in the interests of time economy. The patent dyeing machine has come to stay, and not only stay, but flourish. The number of different makes is now so great that familiarity with all is impossible. One need not make any invidious selection of examples, but may indicate the value of the chief principles of construction. In constructing a dyeing machine one may arrange: (1) For the liquor to circulate through the material; (2) for the material to circulate through the liquor. Or even both may take place.

In judging the value of a machine for any special purpose it should be borne in mind: (*a*) That where material is greatly compressed while under the influence of hot dye-liquor it will never regain its original loftiness and spinning qualities. On the other hand, there is little liability of felting or stretching—*e.g.,* of yarns. (*b*) Machines in which the material is completely hidden away during dyeing cannot be made to dye to a nicety in matching colors. (*c*) The circulation of liquor is liable to give rise to channels forming—it is always trying to find the easiest way through. If there is any easy way through for the liquor the material will come out unevenly dyed. Machines with a circulating pump which can be reversed are better, as the reversal of flow generally stops channel formation in one direction. (*d*) Packing machines simply act as filters for liquor—and very good filters, too. Dyestuffs, etc., used must therefore be in perfect solution, and the entire liquor quite clear of particles. The machines on the packing system are more adaptable for various forms of material than any other. They have been used for the bleaching, sizing, etc., mentioned previously.

Machines in which the material is moved through the liquor include the common winch, pad, and jig. Kettle and tub dyeing also are on this principle. On the whole, machines of this type dye more evenly than the former class, and are simpler to control, but are more liable to drag, fray, or felt materials, but not so liable to make them sad and heavy as packing machines. A new principle in hank dyeing was introduced recently. The hanks are lifted from contact with the hank rod by the rush of liquor in flow. This principle seems valuable in getting even results with a minimum of mechanical friction on the hank in dyeing. Machines of this type have been found effective in degumming of silk. The loading and packing of most machines is the special point to be learned for each individual case.

These are the main points which decide the effectiveness of patent dyeing machines. They are capable of effecting great economy in dyeing at intermediate stages of manufacture. The initial cost of installation is usually relatively great.

With regard to the utilization of waste products from dyeing, not a great deal has been done. Usually the difficulty has been to get rid of the stuff down the drain if possible. Perhaps the most important thing done in this connection has been the extensive use of re-causticising apparatus for spent caustic soda from mercerizing, etc. Incidentally, it may be mentioned that the sludge of precipitated chalk from a re-causticising plant is valuable for cement manufacture, and also good for a manure if thrown out in lumps or small heaps and allowed to harden till it can be broken up and spread. There is no doubt that more will be done in this direction. The present interest in sudcake, and the attempts to recover unextracted fat, are good indications.—Extracts from an article by M. F., in the *Textile Manufacturer,* Manchester, England.

DYEING OF CREPONS.

The shades at present very popular on Crepon fabrics are copper, reddish tints, heliotrope and violet, bluish green and bright blue, bright green and drab shades. Only those dyestuffs should be used which equalize well. The various shades of copper and red tints can be produced by means of Acid Yellow, AT, Orange II., and Brilliant Lanafuchsine, saddening where required with Cyanol Green or Cyanine. Heliotrope may be obtained with an Acid Violet associated with a red or blue dyestuff, such as Azo Wool Violet JR, or Cyanol. Bright blue is generally dyed with Cyanol shaded according to requirements. For dark blue the various Acid Navy Blues are serviceable, and for black Azo Blue Black (Cassella Color Co.), and Azo Acid Black (Farbwerke-Hoechst Co.) After the dyeing the cloth is washed well and squeezed and then dried in the stove over laths. The squeezing should be thorough, otherwise excess of moisture will run during the hanging in the stove and cause unevenness. Woolen Crepons with artificial silk effect-threads require to be treated just the same as those of all wool. The dyeing liquor should, however, generally be slightly acid to bring out the brilliancy of the artificial silk. The majority of the so-called wool dyes leave the artificial silk white. Should it be required to dye the effect-threads this is generally done after the dyeing of the wool by treating in a fresh cold liquor containing phosphate of soda and such substantive cotton dyes as affect the color of the wool the least under these conditions. The following are useful in this respect:—Diamine Fast Yellow, Diamine Black BH, Cotton Red A, Diamine Sky Blue FF, etc. After this, the material is washed, soured with dilute Acetic Acid, and dried.

Cotton Crepons in the popular styles are about the most difficult of any sort to handle. The material is usually of such a character that the threads cannot be properly fixed, and an uneven crepe effect is almost the order of the day. Streakiness is also difficult to avoid. The Crepon effect is produced by mercerizing without tension. The goods are singed, then treated with Diatase to remove the size, and worked for about 20 minutes in warm water, containing about 5 per cent of caustic soda 32 degrees B. It is very important that the manipulation at this stage should be such that although the material is handled at full length it should on no account be stretched width ways. Specially experienced workpeople only should be entrusted with the work. The exertion of pressure and tension, especially intermittent pulling, should be avoided. After this treatment, the goods are boiled preferably in the ordinary winch or vat containing a solution of about 5 per cent of soda and 2 per cent of resin soap. It is better for the quality and appearance of the goods that they should be given two rounds first in the hot liquor, then to bring to the boil, and continue working. Boiling for about an hour meets most cases. After the boiling the goods are washed with warm water and then with cold.

For dyeing light and medium shades bleaching is required and this operation should be accomplished without exception by steeping in a cold solution of bleaching powder of hypochlorite of soda. The period for steeping depends for its duration on the strength of the liquor. When chemicked sufficiently the cloth is washed well with clean water, soured with sulphuric or hydrochloric acid, and again washed. The subsequent dyeing is effected, not on the jigger as in the case of most sorts of cotton fabrics, but on the vat and winch. The pull exerted on the jigger with the cloth running at full width removes the Crepon character of the fabric, while in treating in the vat uneven dyeings may easily result. Great care is required, therefore, in handling these fabrics. As to the actual dyeing the demands made upon the qualities of the colors are mostly more exacting than those made for the wool and half-silk Crepons. Besides fastness to wear a good fastness to washing is usually required. Although the better members of the direct dyestuffs afford fairly satisfactory fastness, in the case of pale and medium shades it is general to after-treat the darker shades, or to produce them with the aid of sulphur dyes. For example, pale blue on bleached material may be dyed with Diamine Sky Blue FF, toned with a trace of Diamine Blue B, and applied in the presence of sulphate of soda and turkey red oil, the latter to assist impregnation. Work at a temperature of 60 degrees C. Pale green:—With Diamine Sky Blue FF and Thioflavine S or Diamine Fast Yellow. Pale slate:—With Diamine Black BH and a trace of brown or red for shading. For medium shades, the best method of dyeing consists in after-treating with diazotised Paranitraniline or in diazotising or developing. After-treatment with metal salts is practised less.

The copper shades, for instance, may be produced with Primuline diazotised and developed with Resorcine, and the yellower shades by developing with Phenol. Browns are obtained with a combination of Diamine Nitrazol Brown G, Diamine Fast Orange EG, and Diamine Brown M. after-treating with 3 per cent formaldehyde and 1½ per cent bichromate of potash, or coupling with Nitrazol C. Blues are obtained with Diamine Blue and Diamine Black BH, diazotised and developed. Dyeings that have been after-treated may be brightened by means of the basic dyes. Blacks are occasionally produced by the diazotising and developing method, but more often by the sulphur dyes. In any case, after the dyeing, the fabric is washed well, squeezed and dried carefully over the tenter.

Cotton Crepons with artificial silk effect threads call for much the same courses of treatment, bearing in mind that it is generally necessary to avoid dyeing the artificial silk darker than the cotton. This requirement can be met by dyeing at low temperatures and reducing the amount of assistant, especially in the case of dark shades. The dyestuffs to be used should be chosen for their adaptability to this class of work.

A less common fabric is the half-woolen Crepon. The cloth is subjected to mercerization whereby the cotton threads shrink and form the Crepon effect. These goods are required to be dyed both in self-colors and in two colors. The self shades are produced by direct dyeing from a weak acid liquor. As the mercerised cotton absorbs the coloring matter very readily, there is not much difficulty in covering it deeply enough.

For the wool, those dyes are used which are taken up from a weak acid or neutral salt solution. For examples, grey may be dyed with Diamine Black BH, Diamine Brown N, and a little Diamine Fast Yellow or orange. The shading of the wool may be done with Orange ENZ, Indian Yellow, and Naphthol Blue Black. The copper or tango shades are produced with Half-Wool Fast Orange G and R, Diamine Brown 3G and M, and Diamine Fast Scarlet GFF.

and for the wool, Indian Yellow and Orange ENZ.

The two-color effects, a sort of shot effect, can be produced by dyeing the wool portion first in an acid liquor with dyestuffs that do not dye the cotton, such as Acid Yellow AT, Lanafuchsin, Alizarine, Cyanol, and others. The cotton is next dyed in a cold liquor with suitable dyestuffs. Take one shot effect, the wool a copper shade and the cotton heliotrope. The wool is dyed first by treating the cloth for one hour at the boil with Acid Yellow AT and Lanafuchsine, and the cotton next in a cold salt-liquor with Diamine Fast Violet BBN and Diamine Heliotrope. Another method of producing two-color effects consists in dyeing the cotton first with dyes that resist boiling acids, and next the wool. This method is employed when the cotton portion is required to be black or a deep color, and the wool a light and bright shade. For an effect, the wool pale brown and the cotton black, the cotton is dyed first by working on the jigger with Oxydiamine Black UI at 50 per cent C., washing with warm and then cold water, and subsequently dyeing at the boil the wool by the vat and winch with Orange ENZ and Indian Yellow with a small amount of salt and formic acid.

It is important that the matching of the color should be done quickly. A further method consists in dyeing the cotton in the yarn before weaving, say a black that will withstand both mercerizing and boiling acid. Then there remains only the wool to dye in the piece.—*The Textile Mercury.*

Notes About Men You Know.

B. W. BINGHAM, superintendent of the Prendagast Cotton Mills, at Prendagast, Tenn., recently spent a few days in Atlanta on a business trip.

JAMES ENTWISTLE has tendered his resignation as overseer of bleaching at the plant of the Crystal Springs Bleachery, Assonet, Mass., and will go to New York, where he has accepted a position.

D. S. MATTOX has resigned as overseer of carding at the Greer (S. C.) Mfg. Co., and accepted a similar position at the Walhalla (S. C.) Mills.

R. A. FAIRCHILD has been transferred from day carder at the Mooresville (N. C.) Cotton Mills to night overseer of carding and spinning in Mill No. 1.

WALTER BROADBENT, who was employed with the Meritas Mills at Columbus, Ga., has returned to his old position as assistant carder of the Amazon Knitting Company at Muskegon, Mich.

E T. CARTER has resigned as superintendent of the bleaching and finishing at the Cannon Mills, Kanapolis, N. C., and will find another position with that company.

J. W. GILLEY has resigned as overseer of weaving at the Pickett Mills, High Point, N. C., to accept a similar position at the Edna Mills, Reidsville, N. C.

R. W. BINGHAM has been promoted to overseer of spinning at the Springfield Mill, Chester, S. C.

J. S. STROUD has resigned as superintendent of the Lauderdale Cotton Mills of Meridian, Miss.

ELLIS T. GURRY, formerly at the Nottingham Mills, Providence, R. I., has accepted a position in the combing department at the Lorraine Mills, Pawtucket, R. I.

GEORGE H. LANIER, of West Point, Georgia, vice-president and general manager of the Wellington Sears string of mills, with offices at that place, spent the early part of January in Boston on a business trip.

J. A. ROBERSON has resigned as overseer of weaving at the Dilling Mill, King's Mountain, N. C., to accept a similar position at the Mecklenburg Mills, Charlotte, N. C.

CHARLES A. TAYLOR, overseer of the cloth room at the Knight Mill, Centreville, R. I., and James McNabb, second hand of weaving of the same plant, have resigned to accept positions with the Stark Mill at Manchester, N. H., as supervisors of sections of looms.

ALVAN E. BULLOCK, boss carder for the Lancaster Mills, Clinton, Mass., has resigned to become assistant superintendent of the Stark Mills, Manchester, N. H.

J. L. MCCOY, formerly second hand in the spinning room at the Woodside Mills, Greenville, S. C., has accepted a position as overseer of spinning at the Hartwell (Ga.) Cotton Mills.

C. M. SHELTON has resigned as overseer of spinning at the Franklin Mill, Greer, S. C., to accept a similar position at the Lois Mills, Douglasville, Ga.

JOHN L. DAVIDSON, for several years general manager of the Georgia Cotton Mills, Griffin, Ga., has become superintendent of the Eureka Cotton Mills, Chester, S. C.

C. D. MARGETTER has resigned as overseer of weaving at the Mecklenburg Mills, Charlotte, N. C., to become superintendent of the Pickett Cotton Mills, High Point, N. C.

STEPHEN W. BASTOW is now superintendent of dyeing, bleaching and finishing at the Nashua Manufacturing Co., Nashua, N. H.

E. M. CONVERSE, of the Mankato Spinning Mill, Mankato, Minn., was completely surprised when the employees of the card and spinning rooms gathered around his desk and presented him with a beautiful library lamp. Mr. Converse thanked them for their generosity and wished them a happy New Year.

N. M. NEAL has resigned as overseer of weaving at the Edna Mills, Reidsville, N. C., to accept a similar position at the Riverside Mills, Worthville, N. C.

T. B. FARMER has accepted the position of overseer of spinning at the Franklin Mills, Greer, S. C.

J. H. HAMBLEY, former treasurer of the Quidnick-Windham Mfg. Company, has been placed in charge of the Quidnick (R. I.) plant of this company as superintendent.

WALTER B. KNIGHT, who has been agent in charge of the Willimantic (Conn.) mills of the Quidnick-Windham Mfg. Co., has been continued in this same position since the termination of the receivership. Mr. Knight is now recovering from an operation for appendicitis, recently performed. He has the best wishes of his many friends for a rapid and complete recovery.

M. W. MOORE, formerly of Alexander City, Ala., has accepted a position at Sylacauga, Ala.

JOHN P. MCCAVITT has resigned as overseer of spinning at the Knight Mill at Centreville, R. I., to accept a position with the Stark Mill at Manchester, N. H. He was succeeded by Joseph Suprenant.

ARTHUR D. LOWN, lately of Fall River, Mass., and formerly of the Fulton Bag & Cotton Mills, Atlanta, has suc-

ceeded John P. Shaw as superintendent for the Manhasset Manufacturing Co., Putnam, Conn., makers of tire cloth. Mr. Shaw resigned this connection on account of ill health.

W. R. TATTERSALL, superintendent of the Gaffney, (S. C.) Mfg. Co., has returned from West Warren, Mass., where he was called by the illness of a near relative.

R. B. HUNT has accepted the position of superintendent of the Mississippi Cotton Mills, Morehead, Miss.

WM. E. PECK, agent of the Baltic Mill, at Baltic, Conn., has been made general manager of the Quidnick-Windham Mfg. Co., with mills at Willimantic, Conn., and Quidnick, R. I.

C. H. NEWELL, who was appointed receiver for the Quidnick-Windham Mfg. Company, at Willimantic, Conn., and Quidnick, R. I., in the recent financial difficulties of these mills, was elected treasurer of the mills at the time the receivership was terminated.

KENNETH R. HOOKER, of the Putnam-Hooker Co., removed his headquarters about January 10 from New York to the main office of the Putnam-Hooker Co., which is in Cincinnati. The New York office at 236 Church Street will be maintained and Harry Trippe, who has been associated with Mr. Hooker there for many years, will be in charge.

W. E. TISDALE has resigned as overseer of carding at the Deep River Mills, Randleman, N. C., to become carder and spinner at the Edna Cotton Mills, Reidsville, N. C.

FRED J. COGGERSHALL, formerly second hand of carding at the Pocassett Mills, Fall River, has accepted a similar position at the Narragansett Mills under E. H. Wilkinson.

HARRY TUNSTALL, superintendent of the Grant Yarn Co., Fitchburg, Mass., has been appointed to succeed Herbert E. Walmsley as agent of the Wamsutta Mills, New Bedford, Mass. Mr. Tunstall has had a wide experience in textile mills. He was overseer of carding and later superintendet of the William Clark thread mill, Westerly, R. I. He later occupied a similar position with the Kerr thread mill, Fall River, and the Royal Weaving Co., Pawtuckett, R. I.

TOM TISDALE has resigned his position with the Chesnee (S. C.) Mfg. Co., to become overseer of carding at the Deep River Mills, Randelman, N. C.

I. L. RAY, formerly overseer of weaving at the Barker Mills, Mobile, Ala., is now night overseer of weaving at the Asheraft Mill, Florence, Ala.

T. E. PAYNE has accepted the position of superintendent of the Watts Mfg. Co., Taylorsville, N. C.

D. W. WILLIAMS has resigned as overseer of the weaving at the Ottaray Mills of Union, S. C., to accept a similar position with the Pacolet Manufacturing Company at Trough, S. C.

BERTRAM H. TILLOTSON, better known to his friends as Herbert, has been promoted from the position of second hand in the Fall River Iron Works Company's No. 7 mill to overseer of weaving in the same company's No. 2 mill, both of Fall River, Mass.

CHAS. H. WHITE has accepted the position of superintendent at the Puritan Cordage Mills, Louisville, Ky.

J. O. WHITE, general manager of the Moore Cotton Mills, Lenoir, N. C., has been elected president of that mill.

H. F. JONES, superintendent of the Eureka Mills, of Chester, S. C., has accepted a similar position with the Lauderdale Cotton Mills, of Meridian, Miss.

W. FRANK SHOVE, treasurer of the Wampanoag Mills and the Pocasset Manufacturing Co., at Fall River, Mass., has resigned from the Wampanoag Mills to devote his entire time to the Pocasset Manufacturing Co. While it is understood that his resignation is in the hands of the directors, he will probably remain until his successor is chosen.

GEO. S. CAINE has resigned as superintendent of the Riverside Mills, Worthville, N. C., and has accepted the position of superintendent of the bleaching and finishing at the Cannon Mfg. Co., Kannapolis, N. C.

W. B. WARDELL has resigned as overseer of carding at the Walhalla (S .C.) Mills, and accepted a similar position at the Greer (S. C.) Mfg. Co.

E. D. MAYNARD has been promoted to superintendent of the Chronicle Mills, Belmont, N. C.

JOHN P. FARNSWORTH, president of the Providence Dyeing, Bleaching & Calendering Co., Providence, R. I., has been elected vice-president of the National Association of Finishers of Cotton Fabrics, recently organized. The object of the organization is to keep the members in close touch with one another.

I. K. EDWARDS, of Lindale, Ga., has accepted the position of second hand in spooling at the Anchor Duck Mills, Rome, Ga. He will also be director of the band.

J. E. WILLIAMSON has resigned as manager of the Holt-Morgan Mills, Fayetteville, N. C., to become general superintendent of the Eureka and Springstein Mills, Chester, S. C., and the Fort Mill Mfg. Co., Fort Mill, S. C.

GRANT WALKER has been elected president of the Naumkeag Steam Cotton Co., Salem, Mass. Mr. Walker was for several years owner of the Danvers Bleachery and a director in the Naumkeag Co. He will fill the vacancy caused by the death of John F. Brooks.

J. A. SHIPES has returned to his former position as overseer of spinning, spooling and warping at the Cowpens, (S. C.) Mfg. Co.

W. W. GREER has resigned as second hand in the weaving at Brandon Mills, Greenville, S. C., and has accepted the position of overseer of weaving at Ottaray Mills, Union, S. C.

J. G. MCDONALD has resigned as superintendent of Marlboro Mills No. 3, McColl, S. C., and has accepted a position with the Bladenboro (N. C.) Mills.

G. R. COLLINS, of Birmingham, Ala., has accepted the position of overseer of night spinning at the Prendergast (Tenn.) Cotton Mills.

F. G. ASBELLE has accepted the position of overseer of carding at the Seminole Mill, Clearwater, S. C.

CLAUDE CALLAS has accepted the position of night overseer of spinning at the Courtenay Mfg. Co., Newry, S. C.

BEN MONTGOMERY has been elected secretary and treasurer of the Drayton Mills, Spartanburg, S. C.

GUS KISER has become night superintendent of the Whitnel (N. C.) Mills.

W. A. FRASER, of New York, formerly boss dyer at the Tilton Mills, Tilton, N. H., has returned to resume his old position.

A. G. PITTMAN has resigned his position with the Erwin Mills, West Durham, N. C., to become night overseer of carding at Prendergast, Tenn.

H. E. BATES has resigned as superintendent of the Monaghan Mills, Greenville, S. C., to accept a similar position at the Victor Mills, Greer, S. C.

I. L. BRITT, carder and spinner at the Dillon (S. C.) Mill has been transferred to overseer of spinning and winding at the Maple Mills of the same place.

M. E. STEVENS, who was for several years superintendent of the Columbus Mfg. Co., and later with the LaGrange (Ga.) Cotton Mills, has accepted the position of agent at the Mississippi Cotton Mills, Morehead, Miss.

JOSEPH SUPERNANT has been appointed to succeed John McCavitte as overseer of the rlng and mule spinning at the Centreville Cotton Mill, Centreville, R. I. Harvey J. Duhamel has also been engaged as overseer of ring spinning at B. B. & R. Knight's Grant Mill, in Providence.

J. H. FIELDS has resigned as overseer of spinning at the Riverside Mills, Anderson, S. C., to accept a similar position at the Toxaway Mills, of the same place.

J. I. PETTIT has been promoted from day second hand in spinning to night overseer of spinning at the Mollohon Mills, Newberry, S. C.

RALPH SMITH, who has been assistant bookkeeper at the Royal Mill, River Point, R. I., has accepted the position of bookkeeper at the Clinton Mill, Woonsocket. He has been succeeded by Leroy Kent.

W. J. THACKSTON, of Greenville, S. C., has been elected secretary of the Parker Cotton Mills Co.

A. M. LAW, of Spartanburg, S. C., who recently underwent an operation in a hospital at New York, is improving rapidly.

GEN. LYMAN B. FRIEZE, general manager of the Cranston Print Works, Cranston, R. I., and probably the oldest cotton goods finisher in active business in the country, recently celebrated his 90th birthday. He received many congratulations from the department heads at the works, and also from numerous friends.

W. F. HOWARD, overseer of weaving at the Glen-Lowry Mill, Whitmire, S. C., has been elected mayor of his town.

RALPH Y. COOPER recently announced to his many friends the fact of his engagement to Miss Miriam Frost. Mr. Cooper is superintendent of the plant of the Cooper Underwear Co., at Kenosha, Wis. The wedding is expected to take place in the near future.

A. B. CALVERT has resigned as secretary and treasurer of the Drayton Mills, Spartanburg, S. C., but will continue as president.

J. E. WICKER has resigned as superintendent of the Holt-Morgan Mills, Fayetteville, N. C., to accept a similar position at the Sterling Mills, Franklinton, N. C.

T. W. MACKEY has resigned as purchasing agent of the Highland Park Mills, Charlotte, N. C., to accept a position with the Elizabeth Mills, of the same place.

J. O. GODFREY, overseer of No. 2 spinning at the Dan River Mills, Schoolfield, Va., has been transferred to a similar position in Mill No. 1.

Practical Problems Discussed by Cotton's Readers

We invite our readers to make use of this department for the discussion of any and all problems arising in the mill or the finishing plant. Questions, answers or letters need not conform to any particular style and will be properly edited before publishing. The editors do not hold themselves responsible for any statements of opinion or fact which may appear in this department unless so indorsed. This department is open to all. Suitable letters are paid for in cash.

ANSWERS TO QUESTION ON INSPECTION.

EDITOR COTTON:

I have had a great deal of experience in cloth inspection and mostly on such cloth as outlined in the question by "E. M." To my mind, I hardly think that any one color can be adopted, for the reason that these goods often have colors printed upon the face of the fabric, after it has been woven in the white, such colors as ecru, light blue, blue, and pearl, in case of dimities, while in case of lawns, the fancy grades often have color effects made by printing floral stripes, small flowers, etc. The patterns are never woven; they are always printed, and usually bright colors are adopted.

In general, I never found a color to give better results than black for all classes of cloth. Black is almost universally adopted for inspecting tables by builders of cloth room machinery.

A method to find defects in the cloth, which I have used successfully, is to have a roll at the top of one of the cloth room windows, and when the cloth begins to show too many defects, I pass the poorest cloth over this roll, so as to be able to discover the cause. When a bad place shows up, and if a portion of the cloth is bad, say a yard or two, I tie two pieces of colored string on each side of the defective place, if only a bunch, I tie only one string. I next pass the cloth over the inspection table and then I examine every portion of cloth where I tied string. Next, I pull out the bunches or defective threads which enables me to trace the cause in the preceding departments.

I know of no better way to closely inspect a piece of cloth for any defect, than by having the cloth pass between the person and the light. In order to get an idea of the effectiveness of this method, examine a cheap window curtain on a sunny day. If the curtain is wide enough to cover the whole window, the reader will see for himself that the smallest defect can be seen, even oil stains.

Wash. (Mass.)

EDITOR COTTON:

In answer to "E. M." in regard to color for a back ground for examining finished cloth, I would say that in my experience I have found black to be very efficient for all around work on such goods as grey, blue and white, pink and white, red and white, etc.

In mills where they run staple lines year after year, they have a dark brown shellaced surface for the dark shades and a black for the light shades.

Then there is a question of proper light artificial and natural, which will effect results if not properly arranged. In mills making a variety of colors of different texture, tests are made and the cloth for examining laid out accordingly to get the best results. Newehat. (Mass.)

EDITOR COTTON.

Replying to the inspection question by "E. M." in January issue, I use the ordinary clothroom inspecting table, with a black top, and it seems to answer every purpose. If there is something better I shall be glad to learn of it, and also to learn why it is better.

W. (South Carolina.)

EDITOR COTTON:

Regarding the inquiry in your paper for the best background for examining materials like lawns, voiles, etc., with a view to finding defects, I secured various specimens of these goods and examined them critically above various colored backgrounds, and I came to the conclusion that the best background for the purpose was black velvet. This showed up the material better than any other, and being black, gave no tinge of any complementary color to the goods examined. D. P. (Scotland.)

EDITOR COTTON:

I have never come across a condition such as the question by "E. M." in the January issue seems to suggest. All the cotton inspection perches I have seen were arranged in front of a window with the operator looking through the goods toward the light. The operator sits alongside of a plaiting arrangement and can look through the goods for weaving or spinning imperfections, oil spots, stains, etc., or bleaching troubles of various kinds. In some plants they prefer to roll the goods on a shell instead of plaiting onto a truck, but the principle is the same.

B. W. S. (New Hampshire.)

EDITOR COTTON:

For the ordinary inspection of cotton fabrics an inspecting table is all that is necessary, and the cloth may be pulled over either by hand or by mechanical means. This method is usually applied when it is a question of removing knots, broken threads or similar defects. When, however, the fabrics are bleached or finished, and particularly when the finishing is done on commission for a manufacturer, it is necessary to examine the pieces more thoroughly both before and after the bleaching and finishing operations. So far as the writer is aware, there is no method of examination or inspection which is as satisfactory as that of drawing the cloth between the inspector and a good light—the window may be either natural color or blue. One need only remove his pocket handkerchief and hold it up to the light to prove the efficiency of such an inspection. Light places, irregular warp or filling threads, broken warp or filling threads, thin places or cracks, imperfect interlacing, broken patterns, oil or metallic stains, small holes, or almost all other kinds of defects are exposed to view, and in general easily detected, provided that the cloth is not drawn forward too rapidly. When mechanical means are adopted for moving the cloth, the drawing rollers are placed in and out of action by a lever operated by the attendant's foot; this leaves both the hands of the inspector free to attend to the work, and in addition the cloth usually passes before him free from folds or creases. "Outsider." (Great Britain).

DESIRES INFORMATION.

EDITOR COTTON:

I note with interest the angle gauge described in the series of articles on carding now running in COTTON, by H. C. Wood and shall be glad, as one of your readers, if you will have Mr. Wood write a letter to the practical discussion department describing a little more specifically the exact manner of using this angle gauge.

Student. (Georgia.)

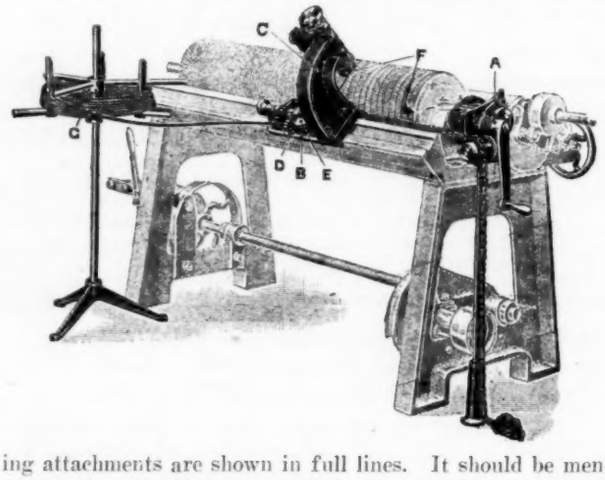
LICKER-IN WIRE MOUNTING DEVICE.

EDITOR COTTON:

I was interested to note in the December issue of COTTON the reference to the machine for straightening and grinding licker-in fillet. Mr. Wood has brought out a point here which I have seen discussed very little, which seems worthy of more attention. In this connection I am inclosing the picture of a device, which has recently been attached to a similar machine of English make for the purpose of rewinding or mounting new licker-in fillet.

It frequently happens that licker-in rollers require a new length, say two or three yards, of new wire, to make some damaged place good, while the rest of the wire is well fitted for further service. In other cases it happens that the wire becomes too much worn for further useful service, in which case the roller must be entirely re-clothed with new wire.

The device illustrated is specially arranged for both the above-named purposes. It consists of a licker-in grinding and dressing machine with an extra attachment for mounting new wire. The machine as used for the former purpose is shown in shadow, while the additional wire-mounting attachments are shown in full lines. It should be mentioned that in this case the wire-mounting apparatus is designed to fit on the grinding and dressing machine without necessitating any alterations whatever. Little description is needed to make the operation of the machine clear, as the work is very simple and the machine easy to manipulate. A stand G contains the supply of new wire, which passes from the reel to the mounting head C. The latter is firmly secured to the platform B, which is adapted to slide along the bed extending the full length of the machine.



The platform B carries suitable devices for receiving the new licker-in wire from the reel G and guiding it into the spiral grooves in the licker-in roller as the latter revolves. The mounting head is provided with adjusting devices of the most precise character, by which the wire-inserting mechanism can be brought to the most exact position and the correct angle of inclination for inserting the wire. A caulking pulley F pivoted on the mounting head C serves the purpose of pressing the inserted wire firmly into its groove. The whole of the device is operated by the handle A, which is set-screwed on the end of the licker-in shaft, and by means of the worm and wheel gearing, and the chain, the mounting head C is traversed along the roller. Change pinions are provided so that the rate of traverse of the mounting head can be kept in exact rela-

tion to the spacing of the spiral grooves in the licker-in roller. I believe such a device will prove a very valuable addition to the equipment of those mills where, from either choice or necessity, they grind and re-clothe their licker-in rollers on their own premises.

Observer. (South Carolina.)

CARE OF PICKERS AND CARDS.

EDITOR COTTON:

Before noting a few points of interest on taking care of pickers and cards, I would like to reply to one or two statements in "Wash's" article on "Builders and Flyers" in the November issue of COTTON. In the ninth paragraph, in referring to the rail changing before the completion of the lift, he says, "Owing to the twin gear being set too deeply, etc."

To see if the twin gears are set right is one of the first and most important things to do, and if it is discovered that they are set too deep, or not deep enough, it could easily and soon be rectified by any fixer that knew anything at all. In regard to his closing paragraph in the same article, I may say that I have never worked in any cotton mill where a man would be discharged for putting a new presser on a flyer. In order to give a presser enough clearance you sometimes have to file off a little, or build a bad bobbin, and if "Wash's" ideas are the same in all matters, he would have the machine-shop larger than the cardroom. I have just been re-pegging some slubber flyers, and after riveting, I filed them flush. I suppose I took a couple of strokes more on one side than the other, but anyway the overseer informed me that the frames were running ninety per cent better since they were fixed.

In taking care of pickers and cards there are innumerable points to watch and the first one is to have the hoppers kept about two-thirds full, and the waste, which is reworked, to be fed uniformly and not all put through in the morning, leaving none for the rest of the day. Try to get all the impurities out of the cotton going through, and do not be satisfied until every ounce of seed, leaf, etc., that can be taken out without losing good cotton is taken out. Take it for granted that the cards are a weak link in the processes of cotton-spinning, and therefore give them as little real cleaning of the cotton as is possible. Have the drop-boxes underneath the dirt-bars of pickers cleaned out about every two hours, as that part of the box nearest to the cages, on account of its inclined shape, soon gets filled up and of course from then, until the boxes are emptied, the dirt must go through with the cotton. At some mills, if you ask the picker-man how many times he cleans out the drop-boxes, he will say twice a day, and that would be the case whether the day consisted of nine or twelve hours, so it is very evident they should be cleaned out when necessary, and not by the day.

Do *not* put belt-dressing on the evener-belts of the pickers, as it prevents that free-sliding motion which is so essential to good work, and if the belt is reasonably tight it will take care of the feed all right, especially if about the same weight of laps is on the apron all the time. What I mean is to have a full, three-quarter, half and quarter lap on the apron, as nearly as possible, as this means less variation by the belt slipping. This will give better results yard for yard and regulating the evener, will be more easily effected.

Look carefully to the inside of feed aprons, and have have them kept clean; also the grooved pulleys they revolve upon, as any dirt or grease there will tend to destroy the efficiency of the cone belt and evener and sometimes, if very dirty, will cause the apron to rub and stop running.

The lap-racks should be free so they will run down alone, if the foot is placed on friction-plate and released. See that the beginning of a new lap is placed in position over the lap-roll and the racks run down as quickly as possible.

Do not have the clearer which rests between the bottom calender rolls get dirty or raised from any cause, or the lap, during the first two or three yards particularly, will be uneven, caused by its being held back, as it were by rubbing on the raised part of clearer.

When the laps are carried to the cardroom and placed in the cards they should be handled carefully and not get torn to pieces as sometimes happens, and if some of the laps break with three or four yards left on, either the lap-rods are out of truth, or it is caused by the picker-man in starting a new lap and wrapping the beginning of the lap over too far.

Having secured a cleaner lap it is possible to set the flats a little closer to the cylinder, but never, in my opinion, nearer than .009 of an inch at the last three setting points and .010 of an inch at the first two, but when setting we must have in mind the production of the card and the weight of the lap per yard. Set the back-plate at about .016 on top and .020 on the bottom, or the web in front is liable to be dead and cloudy-looking. Set the front of licker-in screen to .022 and the under-casing from .022 near the licker-in, to about .034 in front of the cylinder. These settings, of course can be varied according to the amount of fly required to be taken out, but the idea of settings around the cylinder is to have a continual reducing of the space, between the front of the under-casings, and the point where the flats leave the cylinder. The doffer setting in relation to the cylinder should be a fairly tight .007 of an inch so that the fibres are carried off from the cylinder without being taken around, as this would weaken the fibres, and if the setting at this point was too far off, the showing of any slight depressions, etc., caused by the card being choked, would be very pronounced in the appearance of the web.

On some makes of cards, the tin plates projecting under the web are a positive source of leaf and other impurities getting into the sliver and the sooner they are done away with the better it will be. Some of them are so close to the calender rolls, that when an end is being pieced up, the accumulations of leaf, short fibres, etc, are carried forward into the sliver and as these impurities are greasy from the oil dripping from each end of doffer-comb, this dirty sliver helps to clog up the flutes in the metallic rolls on the drawing-frames, causing them to jump and cut the sliver being put through.

The parts of a card where the web is combed off are generally the least looked after, and the proper way to do it is to run out the web on Saturdays and have a thorough cleaning take place so there will be less danger of bad work and ends breaking down. When brushing off the ceiling, posts, windows, etc., it should be done in the noon-hour so the dirt will not go in the work, and when the pulleys are brushed out when running, there should always

be a man to hold a strip of cloth over any part of the machines where dirt is liable to fall into the work, as it is not any use to get all you can out of the cotton and then deliberately put some of it back by this means.

Another fruitful source of trouble is letting the end of a lap run through. The help should be given to understand that doing this repeatedly, as seems to be the case in many mills, is cause for instant dismissal. They seem to think that neglecting to put in laps does not matter very much, whereas the fact is, this duty should be second to none. The card attendants should be shown how to make a good piecing, and how to keep all single and double out of the work, as besides making uneven numbers, it gives unnecessary trouble to the operatives on the drawframes.

Lanes. (Georgia).

FURTHER COMBER INFORMATION.

EDITOR COTTON:

As considerable discussion has arisen concerning combers, their setting, and their care, I am sending you 25 reasons why the sliver cuts or pulls apart on the table of the comber. I am sure these will make interesting reading for many comber men, and I would appreciate having other readers of the discussion department express their ideas and experience along similar lines.

In discussing these reasons for cut sliver, I am going to select certain parts of the comber and indicate what will cause the cut work through defects in the part named.

The leather detaching roll will cause cut work if it is allowed to run dry in its bearings, if the necks or the spindles of the roll are allowed to become worn, if the face of this detaching roll is uneven, if this roll is not carefully attended to and kept varnished, or if the cover is allowed to become loose.

The steel detaching roll will also cause cut work if the cam is allowed to become worn or loose. Even if the cam ball becomes worn it will also have a tendency to cut the sliver. Having a loose gear on the steel detaching roll or failing to have the roll properly timed will also injure the work.

With the nipper knife, it is necessary to have it properly timed. Care should be taken not to allow the nipper cam ball to become worn; neither should the nipper cam be allowed to wear to any great extent. Nippers set too wide will also cause cut work.

The calender roll should be properly set and care should be taken not to allow the calender roll gear to become loose.

If the brass roll is not set right, or if not enough tension is placed on the brass roll, either will have a tendency to cause cut work. Also if the brass roll bracket becomes worn or even if the brass roll itself wears, these will cause trouble. Therefore, care should be taken to see that the brass roll bearings are well oiled and do not have an opportunity to wear.

Care should be taken to see that the segment is set correctly. Other things that will cause cut work and broken sliver at the table are: having the buff pan trumpets too small; allowing the table to become sticky or dirty; having the humidity in the room too low; and the use of too much draft.

L. C. (Rhode Island).

WANTS TWIST FIGURES ON MULES.

EDITOR COTTON:

I shall be very grateful to your readers if they will contribute to the practical discussion department of COTTON some methods for figuring twist on mules. Particularly am I anxious to secure some short methods of figuring.

Overseer (Massachusetts.)

FLYER-LEAD VS. BOBBIN-LEAD.

EDITOR COTTON:

I see in the November issue of COTTON where "Lanes" tries to make "Wash" come across with the root of all evil. Let me say here that "Lanes" deserves credit for not agreeing with "Wash" in all cases, as this is what makes "Wash" give us the best there is in him when he answers.

The merits of the flyer lead frames is what interests me most, because I understand a fly-frame better than any other machine. The controversy between "H. C. W." "Lanes" and "Wash" upon this subject is bound to bring out some interesting facts. I do not think "H. C. W." is qualified to write on the subject after his confession that he never worked on flyer-lead frames. In order to understand both systems, you must work on both. I have worked on both and find it very difficult now to reason out what "Wash" has sprung on us. I am not after the $5 check, for I am sure "Wash" is right.

Any hesitation of the bottom cone on a flyer-lead frame will not strain the roving. "Lanes" admits it, but tries to offset this confession by claiming that the belt slipping slightly to the starting point of the bottom cone, would take enough revolutions from the bobbins to strain the roving. I can hardly believe that any reader of COTTON familiar with fly-frames will take this reason as the cause for discarding the flyer-lead frame. But I want to say that if the old Lowell or Brown flyer-lead frames were being discussed, I think I could put one over on "Wash."

When it comes to arguing about an up-to-date flyer-lead and an up-to-date bobbin-lead frame, "Wash" has, no doubt, the better of the argument, and this is my reasons for thinking so:

As "Wash" stated, the only difference in the gearing between a flyer-lead and a bobbin-lead frame, is that the compound pinion is found on the opposite side of the periphery or sun-gear.

"H. C. W." stated in his article that any hesitation of the bottom cone would strain the roving. "H. C. W." is not alone in this belief, for had not the majority of builders looked at the matter in the same way, we would still have the flyer-lead frame.

Now let us stop and study. When the cone is raised, or when the cone is stopped, the flyer and the bobbin revolve at the same rate of speed and the end coils at the top of the flyer. Under these conditions, how can the back-lash be any greater in either system by changing the compound pinion from one side to the other of the sun gear? A consideration of this question should, I think, be enough to convince any skeptic on the point of back lash.

Next, when the bottom cone is stopped, the bobbin and flyer travel at the same rate of speed and no winding on the bobbin takes place. As the flyer leads the bobbin when the botton cone is revolving, the surface speed of the bobbin must equal the surface speed of the front steel roll at

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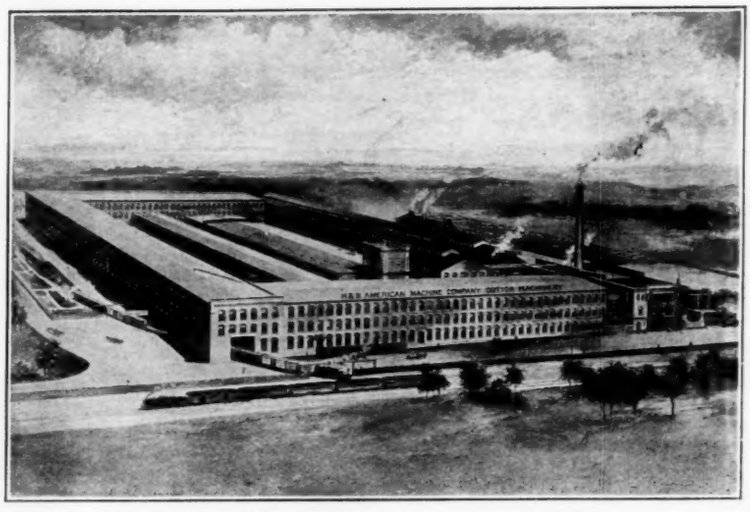

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all times. With such a condition the only way the roving can be strained, as claimed, is by shifting the rack back to the starting point and thus make the surface speed of the bobbin greater than the surface speed of the front roll, but as "Wash" stated, you must shift the rack back to do it.

The only way and the best way to prove these contentions is to hold in mind that the instant the bottom cone stops or lags behind the speed of the top cone, the speed of the bobbin is increased in the same proportion, and when you increase the speed of the bobbin on a flyer-lead frame, you at once create a slack tension. It is very simple. Surely, if the flyer leads the bobbin and any hesitation of the bottom cone increases the speed of the bobbin, then nothing can result from the hesitation of the bottom cone only a slack tension. Supt. (Mass.)

OTHER COMMENTS ON CUT WASTE.

EDITOR COTTON:

While looking over the practical discussion department of the September issue, I was surprised to find that "X. Y. Z. A." criticized my article on "Cut Waste." He tells us that there is no excuse for cut waste in any room. The operatives will never call the overseer or foreman in charge when they want to cut a bobbin or spool, they will wait until his back is turned, then do it, yet "X. Y. Z. A." says, it is a lack of judgment. Well, in one sense it is, but no matter how strict an overseer is, cutting is done in every place, whether to a small or large extent. The writer has seen spooler-tenders have their dinner in the mill, or come in early mornings, just purposely to cut bobbins.

If there is no excuse for cut waste in any room as "X. Y. Z. A." puts it, does he run the section-beams on a slasher bare? I do not know of what department "X. Y. Z. A." is in charge, but by what he says regarding cut waste, I believe he has never seen a new set put through a slasher, unless things are different in Michigan than they are in Massachusetts. The slashing department makes waste and plenty of it. It would be a pretty good practice to run the section beams bare on a slasher for the sake of keeping the waste production down, and sacrificing a few yards or cuts of the finished product or cloth.

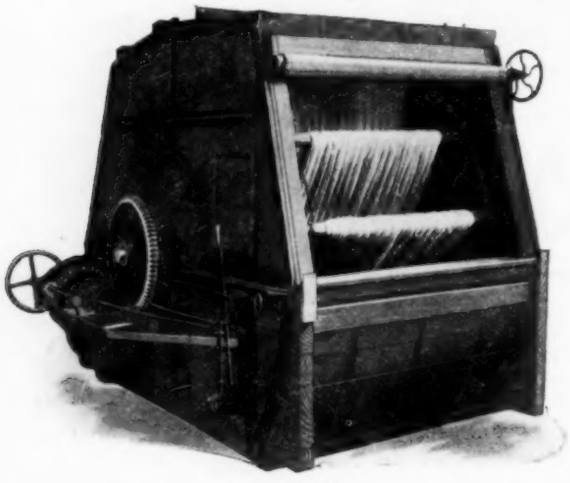
Then he says to watch the doffers lapping the ends over when piecing up on the frames, say for instance the spinning or twisting machines, this of course causes bad and uneven work. If an overseer was paid simply to watch doffers each and every individual would be an overseer; but why not hire a boss doffer to have charge over the doffers? Then he also says that such bobbins will run bad at the spooling department, and that the girl or spooler-tender will commence to cut these bad bobbins so as to get her work up to the next doff. If he never allows cut waste, and there is no excuse whatever for its existence, why is it that this girl cuts the bobbins? He says he does not blame the girl for this. I do, because when the yarn is coming to the spooler tender in bad shape, it is her duty to go and see the overseer, or the person in charge of spoolers and have things straightened out. The writer agrees with "X. Y. Z. A." when he says that the overseer is responsible for every cut bobbin in his room. The writer is glad to exchange knowledge for knowledge, that is why we make the use of this department, which I think is very interesting and helpful. Lewis. (Mass.)

New Machinery and Trade Notes.

A New Skein Dyeing Machine.

THE KLAUDER-WELDON DYEING MACHINE COMPANY, of Amsterdam, N. Y., and Huddersfield, England, have recently placed on the market a new skein dyeing, bleaching and scouring machine. This machine is built on the well known Klauder-Weldon rotary principle to handle cotton, mercerized cotton, woolen, worsted, silk, artificial silk skeins and slubbing dyeing.

These machines are built in single style sizes to dye from 25 to 300 pounds per batch. In double style sizes to dye 300 to 1,000 pounds per batch. The Klauder-Weldon Dyeing Machine Company originated successful skein dyeing machinery and since that time their well known rotary skein machine has come into universal use throughout the world, and is recognized as a standard of economic



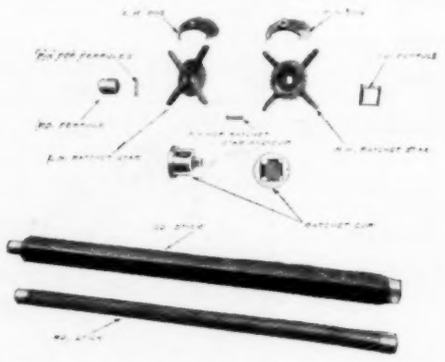
SINGLE MACHINE COMPLETE.

efficiency in dyeing, bleaching and scouring. It has been a labor saver, besides effecting an important saving in dyestuffs, steam and water. But the great feature of these machines has been the fact that the skeins come from the machine perfectly smooth, straight, evenly dyed, and absolutely free from tangling and felting.

This new machine is now being delivered to the trade after many months testing in actual operation and has made obsolete the machine heretofore furnished. It is built under the following U. S. letters patent:

645698—March 20th, 1900.
659906—October 16th, 1900.
999304—August 1st, 1911.
1057635—April 1st, 1913.
1120643—December 8th, 1914.
1120644—December 8th, 1914.
1120645—December 8th, 1914.
1120646—December 8th, 1914.
1120647—December 8th, 1914.
1120899—December 15th, 1914.
1121064—December 15th, 1914.
Other patents pending.

Improvements in this new machine provide a greatly increased capacity, made possible because the new working parts are so constructed that they are all within the segments or on the outside, thereby allowing the shortening of the guard posts enough to add seven inches of yarn bearing capacity to each stick. Sticks of new style machines will fit any new style machine instead of having different length



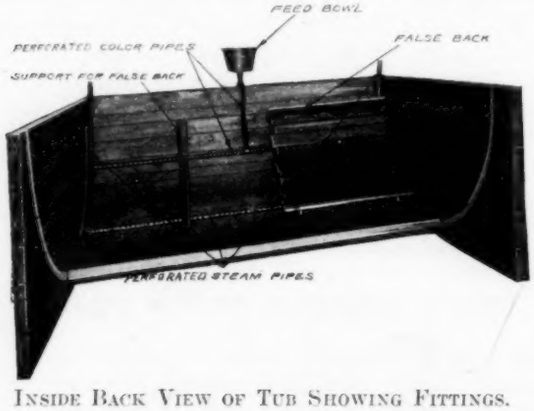
SMALL PARTS USED IN NEW MACHINE.

sticks for different size machines as heretofore. The standard sticks have 48 inches yarn bearing space or 12½ inches each more than on the old 42 stick machine, and the round ends are all 1⅝ inches in diameter as compared with 1 1-16 inches on the round and 1 3-16 inches on the square sticks of the old type.

Owing to the new operation of parts, the loading and unloading of the machine is accomplished in enough less time than before to more than offset the extra time required to handle the increase in material.

IMPROVEMENTS IN REEL.

By the new construction labor is saved and upkeep expense is reduced to a minimum by avoiding the use of small



INSIDE BACK VIEW OF TUB SHOWING FITTINGS.

parts and by heavier construction. The circulation of the liquor through the goods is improved by increased distance between the cup centers on the inner ring.

Gravity dogs are used on the new machine which eliminates the 42 spiral springs used on the old 42 stick machine. Cups with pivoted covers controlled by spiral springs are also eliminated, thus avoiding the use of 84 springs or 126 in all on the new machine. The cups that take the round end of the square stick are formed in the segment and have a sliding cover, one spring controlling

Barrett Specification Roofs

"West End" Factory
Craddock-Terry Co.,
Lynchburg, Va.
Roofers: T. B. Dorwin-
Adams Co.
Lynchburg, Va.

In the South

HERE are the three buildings of the Craddock-Terry Company, the large shoe manufacturers of the South.

They are typical American manufacturing buildings—and there are scores of such buildings in every large city.

All three are covered with Barrett Specification Roofs, and this too is typical, for such buildings are usually roofed in this way.

The reason is simple—it is a matter of best value for the money! Barrett Specification Roofs are the cheapest permanent roofs to build and they cost nothing to maintain.

The unit cost of Barrett Specification Roofs (the cost per foot per year of service) runs reliably about ¼ cent, a lower figure than any other roofing can even approach.

By incorporating The Barrett Specification verbatim in your building plans you make certain that your contractor, whoever he may be, will lay for you exactly the same quality of roof that tops most of the great structures and manufacturing plants in the United States.

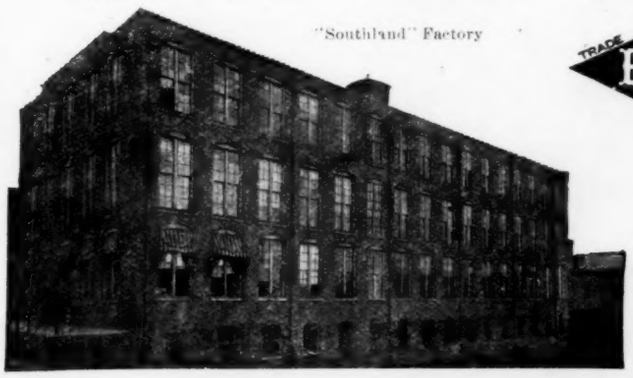
Copies of this Specification with diagrams will be sent free on request to any one interested.

Main Offices and General Warehouse

BARRETT MANUFACTURING COMPANY

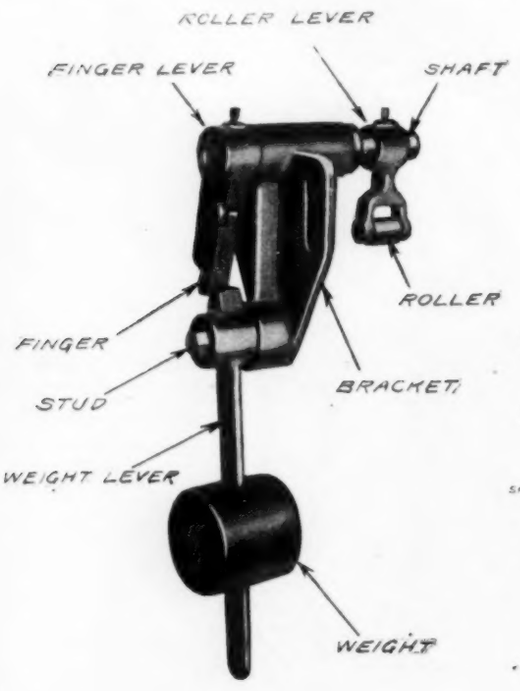
New York Chicago Philadelphia Boston St. Louis Cleveland Cincinnati
Pittsburgh Detroit Birmingham Kansas City Minneapolis
Salt Lake City Seattle
THE PATERSON MFG. CO., Limited: Montreal Toronto Winnipeg
Vancouver St. John, N. B. Halifax, N. S. Sydney, N. S.

"Southland" Factory



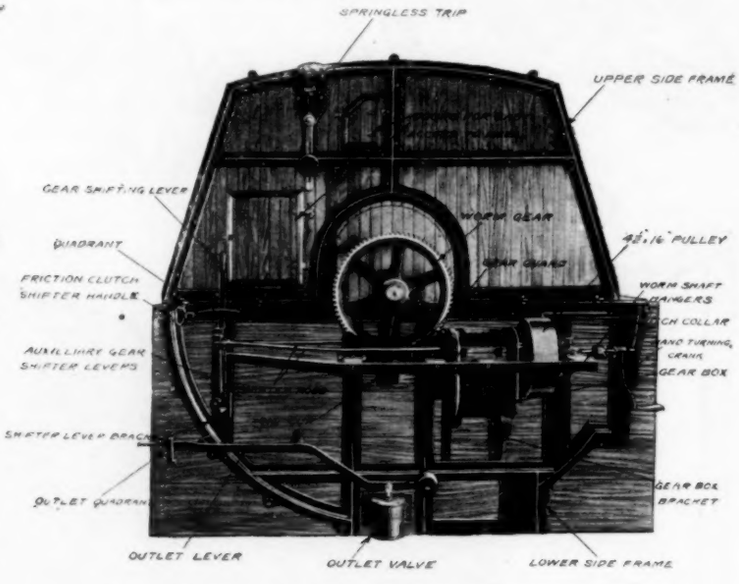
TRADE B MARK

the covers for all the cups in a segment, thus there are only five large springs on this machine. The sticks are held in the cups in the inner rings by a sliding cover, operated by a lever that locks all sticks in position at once. The ratchet cups on the new machine set into the segment, are



when adjusted, are held in position by a hand screw in place of a bolt, spring and chain.

All machines now have a friction clutch drive with three speeds forward and one reverse. The gears are encased, running in oil and it is noiseless. This drive takes the place of two shafts with four cast gears running exposed and giving only two speeds.



A SIDE VIEW OF THE MACHINE SHOWING DRIVE, OUTLET AND TRIP.

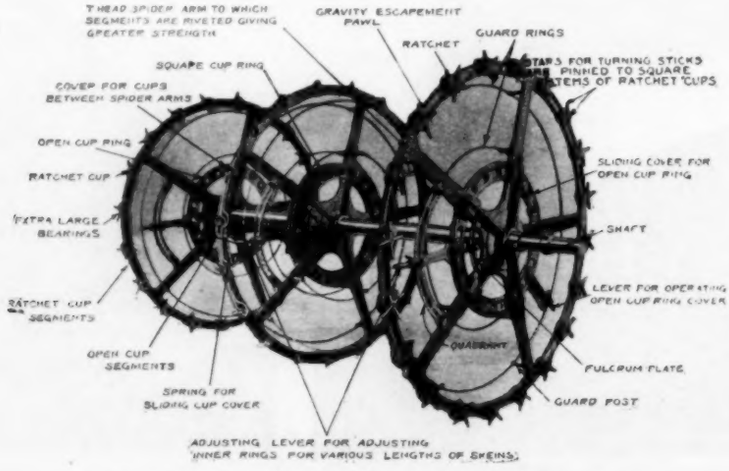
Another new feature connected with this drive is the hand turning device by means of which the reel can be revolved if anything happens to the power or any other cause makes it necessary.

The new tripping device consists of an inside lever which turns the sticks and an outside lever held in vertical position by a weight, the whole being mounted on a shaft which is free to turn in a bearing of proper design. The principal features of this trip are ease of adjustment and the doing away with all springs, also in case of a stick not turning the trip rings an alarm bell and readjusts itself in time for turning the next stick.

Outlets used on dyeing machines are usually a source of annoyance. This improved outlet is opened simply by

SPRINGLESS TRIP

almost on the inner side and have 1 11-16 inch bearing with a diameter of 2 9-16 inches as against a 1 7-8 inch bearing with diameter of 13-16 inch on the old cup. The stem is square with the star wheel pinned on as against the old style of round stem with star wheel screwed on. This method overcomes the danger of breaking the star wheel or stem which would spoil the ratchet cup and was apt to happen on the old style device. The star wheel used is of much heavier construction. The spiders have T head arms which prevent the trouble that sometimes arose from the segments springing or working loose. The inner rings


T HEAD SPIDER ARM TO WHICH SEGMENTS ARE RIVETED GIVING GREATER STRENGTH
GRAVITY ESCAPEMENT PAWL
RATCHET
GUARD RINGS
TABS FOR TURNING STICKS PINNED TO SQUARE STEMS OF RATCHET CUPS
SQUARE CUP RING
COVER FOR CUPS BETWEEN SPIDER ARMS
OPEN CUP RING
RATCHET CUP
EXTRA LARGE BEARINGS
SLIDING COVER FOR OPEN CUP RING
SHAFT
RATCHET CUP SEGMENTS
LEVER FOR OPERATING OPEN CUP RING COVER
OPEN CUP SEGMENTS
QUADRANT
FULCRUM PLATE
SPRING FOR SLIDING CUP COVER
GUARD POST
ADJUSTING LEVER FOR ADJUSTING INNER RINGS FOR VARIOUS LENGTHS OF SKEINS

NEW STYLE DOUBLE 40 STICK REEL DETAILED.

THERE IS
NO RUBBER
IN THE COMPOSITION
OR PRONUNCIATION OF
RU-BER-OID

¶ This great roofing has a good name and deserves to have it pronounced correctly.

RU-BER-OID
PRONOUNCED
"RU" AS IN RUBY
ALWAYS SPELLED WITH
ONE B

¶ RU-BER-OID Roofing has weathered the storms of over 22 years, and the onslaughts of imitators for almost as long.

¶ RU-BER-OID has been to the South Pole with Captain Scott and to the North Pole or thereabouts with various other explorers.

¶ And to all intermediate points has RU-BER-OID gone—invairably doing what is claimed for it.

¶ KA-LOR-OID (colored RU-BER-OID) is the same durable material with the added attraction of beautiful and permanent colors—Tile red—copper green.

Send for Samples.

The Standard Paint Company

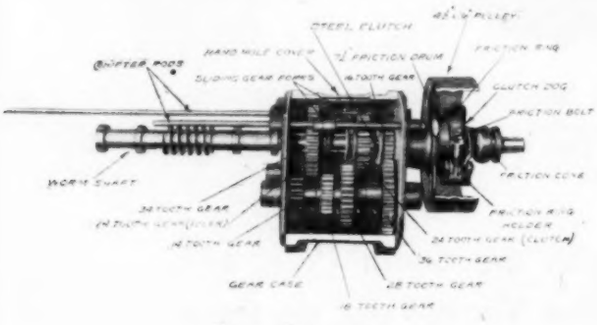
100 Williams St. **New York**

For Leaky Collars & Pits
IMPERVITE
is GUARANTEED to Waterproof

the pressure of the foot on a lever at the front of machine and held open by a lever quadrant specially designed for the purpose. When closing the outlet the lever is released by foot pressure and the valve is closed by a balancing weight. These outlets are made of large capacity, thus draining the tubs quickly, so as to save all the time possible.

All tubs are made with round bottom which reduces the liquor capacity, besides doing away with the danger of leaking.

The construction of this machine is as follows: The tub is built of specially selected three inch Georgia pine staves. The side staves are held tight together by bolts running through them from top to bottom and set in cast iron frames. There is a dado on the inside into which the cross staves fit. These staves are held in place by rods extending through the sides across the tub and by bands drawn around the bottom and through staves at the top, front and back. The tub is emptied by a lever valve on the side of tub, flush with bottom or in the bottom, operated by lever at front of machine. A perforated steam pipe in the back of the tub, near the bottom, extends across behind a false



DRIVE DETAILED.

back which forms the circulation and prevents steam from coming in direct contact with the yarn. Dyestuff is introduced from a feed bowl on the back of the tub by means of a perforated pipe, located behind the false back, above the steam pipe. The location of steam and liquor pipes insures equal distribution of the dye and a perfect circulation of the dye bath without such agitation as to mat or tangle the yarn.

The friction clutch drive is located on the side of the tub and is of the enclosed gear type, permitting of three speeds, forward and one reverse. It is operated by levers located at the front of the machine and can be built either straight or angle for belt or motor drive. In connection with this drive is a device for turning the reel by hand. The reel consists of a metal shaft set in bearings on the tub sides. On this shaft are keyed metal spiders, the outer circles of the reel which carry the cups for the square sticks, are formed by metal segments riveted to the T head spider arms. After the square end of the stick is placed in the cup on one segment, the round end of the stick slides into the cup on the other segment and is held in place by a novel sliding cover arrangement. The cup that receives the square end of the stick has a square stem which projects outside the segment and to which a ratchet and star wheel is pinned. A trip located at the side, near the top, consists of an arm with a roller at the point of contact, which extends through the side and engages the stars, causing each stick to make a quarter turn each revolution of the reel, when the yarn hangs free on the square stick. This device overcomes all danger of stick marked yarn and every part of the skein receives the same treatment by the dye bath. When a stick fails to turn, the trip, which is controlled by a weight device, is released and a bell attached to its signals the trouble. The trip readjusts itself to turn the next stick, avoiding the chance of the machine running without the sticks being turned as well as all danger of breaking the star wheels or ratchet cup stem.

When the machine is reversed the trip is automatically disengaged. The cups for the inner round sticks are located on rings, movably attached to the spiders. These rings are built single or double for dyeing different lengths of skeins and are fitted with an adjusting device having a range of several inches. The cups on one ring are open. The end of the stick is put through this first, then is drawn back until the other end of the stick goes in the solid cup on the other ring. The sticks are locked in by a sliding cover on the back side of the open cup ring operated by a lever.

Guard rods supported by posts attached to the spider arms prevent the yarn from coming in contact with the metal parts of the reel. All sticks are of specially selected maple or cypress with metal ferrules on both ends. The top of the machine is of one inch matched cypress, supported by cast iron side frames which are bolted to the lower side frames and by rods extending across the top through the side frames. Doors in the side permit of sampling or inspection without rolling up the canvass curtains which close the front and back to confine the steam.

The metals used in the construction of the machine are iron, bronze, monel metal or German silver, according to the dyeing processes to be used. The tubs can be lined with copper or lead.

The November, 1914, number of *Cotton Chats*, the monthly organ published by the DRAPER COMPANY at Hopedale, Mass., contains an announcement in regard to the seventy prizes amounting to $375.00 which they distributed on the pay day before Thanksgiving among about 450 of their tenants as yard prizes. These prizes were based upon the general condition of the premises and seven entire pages of *Cotton Chats* of this issue is given up to illustrations of houses and streets in Hopedale, Prospect Heights, and Milford. In all these cases the houses are tenant property belonging to the Draper Company, and are excellent examples of employees' houses that are real homes.

James B. Fitch, General Manager of the D. D. FELTON BRUSH CO. of Atlanta, Ga., has been appointed chairman of the broom and brush section of the International Association of Rotary Clubs at their San Francisco convention to be held the week of July 18th, 1915. Some interesting developments may be looked for in the program of this section of which he will be in charge.

It is reported that an order has been placed in England for 1,000,000 yards of cotton khaki, which will be made into overalls for the soldiers. If the experimental use of the overalls gives satisfaction a big demand for cotton khaki is expected, and thousands of looms now idle will be engaged in weaving this particular cloth.

"The fuses that save 80% per year" are the logical fuses for you to use—

ECONOMY renewable cartridge FUSES

are giving positive electrical protection and cutting fuse maintenance 80% in great industrial plants, central stations, mines, department stores, steam and electric roads, etc.

ECONOMY renewable cartridge FUSES are the only renewable fuses uniformly rated—the Economy design is the only design so far produced that provides the desired electrical characteristics. All capacities of renewal elements are readily available, making large fuse stocks unnecessary. ECONOMY renewable cartridge FUSES never vent fire nor hold a sustained arc—they are absolutely safe. Now available in knife blade and ferrule types.

Special Announcement

Two renewal elements are now furnished (without charge) with each Economy fuse. Now you figure what fuse is the cheapest, not only to buy, but also to maintain.

Bulletin No. 7 and Samples on Request. Write now

Economy Fuse & Mfg. Company, Kinzie & Orleans Street, **Chicago, Ill.**

Scientific Buying Regulates Your Profits

Buying on lowest first cost consideration alone is not Scientific Buying. Your ability as a skilful buyer makes itself shown when you have purchased on a basis of "performance." Only on a basis of performance can the true saving be measured. The performance to be noted in Shambow Shuttles is their ability to weave an increased and better woven yardage at a minimum shuttle expense.

You profit most from Shambow Shuttles because our efforts are directed toward producing a shuttle that will weave with greater steadiness. Loom-stoppages which hinder production are greatly diminished by a shuttle designed to minimize warp and filling troubles.

Shambow Shuttle Superiority quickly becomes plain to the man who investigates. Investigate now by sending sample shuttle with completely filled bobbin so that we may submit a redesign.

Shambow Shuttle Co., Woonsocket, R. I.

Calendar Notices.

One of the most unique calendars for 1915 has just come to hand. It is that of the STAFFORD COMPANY at Readville, Mass. This is of heavy brass plate of a shape suitable to keep the calendar pad at the proper angle on the desk. On the front of this brass sheet is etched a Stafford "Ideal" automatic loom in polished brass and green on an enameled back-ground. In the center of the loom where the cloth would naturally come into view is fastened the calendar pad. Like all of the productions of the Stafford Company this calendar is convenient, complete and delivers the goods.

THE STUART-HOWLAND COMPANY, 234 Congress St., Boston, Mass., are sending out a very timely calendar for wall purposes. At the top of this calendar is a large reproduction of their new quarters in Boston, while below this is a map of Central Europe in colors, showing the important fortresses and strategic points affected by the present war. All important fortresses are printed in red, making them plain and easy to locate. Below this is a good sized calendar pad designed for practical use.

H. W. BUTTERWORTH & SONS COMPANY of Philadelphia, Pa., have remembered their friends with a petite calendar and stamp case for 1915. This is bound in green seal leather and is exceedingly convenient for vest pocket use and reference.

THE CASSELLA COLOR COMPANY, 182 Front St., New York City, recently distributed among its patrons and friends a holiday souvenir in the form of a framed photograph of the American steamship Matanzas approaching her dock in New York harbor on November 16, 1914, with a million dollar cargo of coal tar colors for American use. It will be remembered that the Matanzas was chartered by a number of American firms and sent to Europe to secure a cargo of dyestuffs which could only be secured by having them shipped in an American vessel. As this was probably the first and only American steamship to reach American shores with an entire cargo of dyestuffs, the event is well worth commemoration and the photograph is one which will be carefully preserved by those of the trade who are interested in dyestuffs.

THE ARABOL MFG. CO., 100 William St., New York, are among the largest manufacturers of starches, sizing compounds, softening oils, softeners and related articles for all branches and varieties of textile manufacture. They are well equipped by modern machinery, laboratory, practical experience and scientific management to give most satisfactory service to manufacturers. They make it their specialty to meet any particular condition of textile manufacturing.

On the first of December LOUIS HIRSCH moved into his new and commodious quarters at 220 Fifth avenue, corner of 26th street, New York City. Mr. Hirsch was formerly located at 173-7 LaFayette street in the same city.

BOOK REVIEWS

All Books Reviewed Under This Heading May Be Procured From COTTON at the Published Price.

CLARK'S DIRECTORY OF SOUTHERN COTTON MILLS Edition of January 1st, 1915. 152 pages. Published by the Clark Publishing Company, Charlotte, N. C. Price $1.00.

This pocket directory of southern cotton mills has been mentioned a number of times before in the book announcement columns of COTTON and the present edition is practically a duplicate of earlier editions completely revised and brought down to date in every respect. One of the features of this pocket directory is the list of purchasing agents giving their business address, phone number, and the mills which they represent. This is a very convenient feature and one which will be appreciated by many. This directory is also equipped with suitable textile maps of the southeastern states, showing the mill and the railroad locations.

Lowinson's Cotton Goods Chart.

LOUIS LOWINSON'S COTTON GOODS CHART FOR 1914 is now ready for distribution and one will be sent, gratis, to anyone requesting it who is legitimately interested.

Requests since last year to record additional constructions of staples have been complied with so that the chart this year contains seven different organizations as well as the varying prices of spot cotton.

Owing to the radical changes in prices in the past year, the new chart will be of exceptional interest. Only legitimate market quotations have been noted and no attention has been paid to the various lots of distressed goods which have been thrown on the market from time to time at sacrifice prices.

No chart of such comprehensiveness has ever been issued in the textile trade and it's publication will be received with gratification by many manufacturers. A copy may be secured free of cost by any manufacturer making the request on his business stationery.

Anthracene Chrome Blue R W N Patented.

As we go to press, we are in receipt of a copy of Supplement No. 57, which shows a series of four valuable shades of bright, dark blue on worsted cloth obtained by using Anthracene Chrome Blue R. W. N. Patented, in combination with either the chrome mordant, after-chrome or anthracene chromate process for dyeing.

This new dyestuff seems to be particularly fast to light, milling, alkalies, carbonizing, decatizing and sulphuring and in consequence is useful for the dyeing of a wide line of fabrics that are intended for severe wear.

The Supplement before us contains the details of several practical dyeing processes adapted to this color and a copy should be in the hands of every working piece goods dyer, and no doubt the Cassella Color Company, at any of its branches, will comply with requests for a copy of this interesting brochure.

China Clays and Talcs

Adapted for Loading and Finishing

DUNN & KRUSE

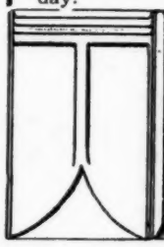
MAIN OFFICE, 180 SOUTH ST., NEW YORK

CORTRIGHT---The Stormproof Roof

ABSOLUTE protection from the elements is assured the house roofed with Cortright Metal Shingles.

They interlock and overlap so that no snow or rain, spark or ember can penetrate.

Adaptable to any building, in any climate. Valuable book on roofing sent free on request. Write for it today.



Cortright Metal Roofing Co.
Philadelphia and Chicago.

JOHN D. LEWIS

Manufacturer of

Logwood Extracts & Hematine

Providence, R. I.

50% Better than ever from YOUR Standpoint

SEVERAL NEW FEATURES have been added to the "1912" Cloth Cutting, Folding and Winding Machine which add at least 50% to its value to YOU.

It will cut your cloth—fold the edges—roll it up and give you an exact measurement of every piece of cloth going through the machine.

It saves time, labor, machines and cloth.

YOU ONLY NEED ONE MACHINE where before it required two, and you get an extra strip from every bolt of cloth.

It cuts the corners of expense in every way and leads to more and greater profits.

THE ENORMOUS SAVINGS WILL INTEREST YOU.

Mail a card for complete information and prices.

When in need of special machinery, write me.

J. A. FIRSCHING, 614 Broad St., Utica, N. Y. U.S.A. Dept. "C."

Clinton H. Scovell & Company

Certified Public Accountants
Industrial Engineers

110 State St. CHS&C CERTIFIED PUBLIC ACCOUNTANTS MASS. AND NEW YORK Boston, Mass.

Textile Cost Accounting

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EVERY MILL in the SOUTH to use **Removoil, Loom Lubrik, Myco Non Fluid Oil and Loom Grease, Disinfectants, Myco Grease Size.**

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DO YOU WASH WITH SOAP AND ALKALI?

THERE'S A CHEAPER AND BETTER WAY.

ALUMINA SOAPALITE

The Mineral Soap.

HARMLESS—THOROUGH—EFFICIENT

The Electric Smelting & Aluminum Co.

LOCKPORT Write for Booklet NEW YORK

DIXIE SPINDLE & FLYER CO., Inc.

Expert Overhaulers and Repairers

COTTON MILL MACHINERY

CHARLOTTE, N. C.

KNITTING MILL NEWS.

Notices of mill projects, additions or improvements are solicited for this department. Other notices pertaining particularly to the Southeastern section will be found in the Southern Mill Situation review.

MARYLAND.

BALTIMORE.—The Varsity Underwear Co., has acquired title of several lots on the south side of Eastern avenue, west of Milton avenue. The lots average 70 by 62.6 feet and are being improved by a new factory building. The company gave a mortgage of $23,000 on the property.

NEW YORK.

COHOES.—The Tivoli Mills of the Root Manufacturing Co., have been closed for a week taking stock.

FULTON.—The Spanswick Knitting Co., through W. H. Spanswick, president, states its business the last year has been good, considering general conditions, and mill improvements have just been completed, including the installation of labor saving machinery, at a cost of several thousand dollars. The company is receiving orders and it is planned to double the output this year. The company has been making up European orders.

HORNELL.—It is reported that the Merrill Hosiery Co., have decided to sell their product direct, beginning January 1, and will open an office in New York at 229 Fourth Avenue.

OSWEGO.—The capital stock of the M. W. Brooks Knitting Co., has been increased from $5,000 to $50,000. The volume of shares has also been increased from 100 to 300.

PENNSYLVANIA.

CARBONDALE.—The addition to the plant of the Carbondale Knitting Co., is nearly finished. It will contain the heavy machinery now in the basement of the old mill.

PHILADELPHIA.—Several thousand dollars have been distributed among the employees of the Notaseme Hosiery Co., here, by officials of the company. This is a profit-sharing plan in which the company contributes to a fund twice the amount put aside by the employees.

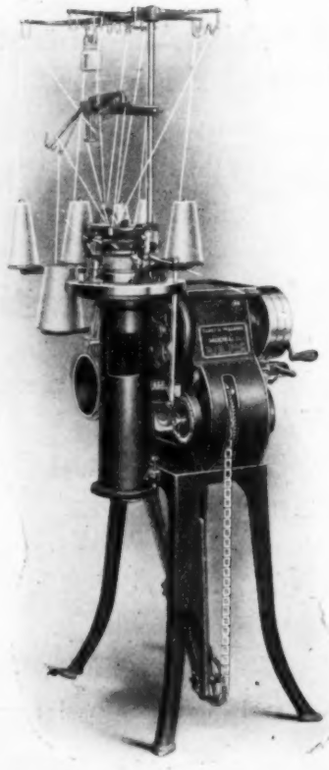
PHILADELPHIA.—The Union Knitting Mills, a Pennsylvania corporation, will be dissolved as far as the corporation is concerned. However, the business will be continued by David Franckel, president, under the corporation name. Sweaters and sweater coats are manufactured.

PHILADELPHIA.—It is reported that the Ashdale Bleachery Co., a new concern, will handle hosiery, underwear, towels and similar articles upon beginning operations. The company was recently organized and Thomas S. Ashdale is the manager.

READING.—It is reported that E. F. Wentworth, Nathan Fiethorn and George W. Hedelfinger have bought the interests of the Fehr Knitting Mill of West Reading. The new proprietors are the principal stockholders in the Model Underwear Mills of West Lawn.

VIRGINIA.

WILLIAMSBURG.—John McGinnis and Edmund Fain, two local business men, have filed articles of incorporation to operate a knit goods plant under the name of the Old Dominion Knitting Mill. The capital stock is given as $10,000 to $15,000. John McGinnis is president and Edmund Fain is secretary and treasurer.



Our MODEL F machine not only makes half hose automatically, dropping them from the machine and effecting a saving of from 7 to 15c per dozen, but will also make women's stockings with a knitted turned welt, saving time, waste and, consquently, money.

Established 1865

Scott & Williams, Inc.

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